Issued June 1970

SOIL SURVEY

Sequoyah County, Oklahoma

UNITED STATES DEPARTMENT OF AGRICULTURE
Soil Conservation Service
In cooperation with
OKLAHOMA AGRICULTURAL EXPERIMENT STATION

Major fieldwork for this soil survey was done in the period 1961–65. Soil names and descriptions were approved in 1966. Unless otherwise indicated, statements in this publication refer to conditions in the county in 1965. This survey was made cooperatively by the Soil Conservation Service and the Oklahoma Agricultural Experiment Station. It is part of the technical assistance furnished to the Sequoyah County Soil and Water Conservation District.

Either enlarged or reduced copies of the soil map in this publication can be made by commercial photographers, or they can be purchased on individual order from the Cartographic Division, Soil Conservation Service, USDA, Washington, D.C. 20250.

HOW TO USE THIS SOIL SURVEY

THIS SOIL SURVEY contains information that can be applied in managing farms, ranches, and woodlands; in selecting sites for roads, ponds, buildings, and other structures; and in judging the suitability of tracts of land for agriculture, industry, and recreation.

Locating Soils

All the soils of Sequoyah County are shown on the detailed map at the back of this publication. This map consists of many sheets made from aerial photographs. Each sheet is numbered to correspond with a number on the Index to Map Sheets.

On each sheet of the detailed map, soil areas are outlined and are identified by symbols. All areas marked with the same symbol are the same kind of soil. The soil symbol is inside the area if there is enough room; otherwise, it is outside and a pointer shows where the symbol belongs.

Finding and Using Information

The "Guide to Mapping Units" can be used to find information. This guide lists all the soils of the county in alphabetic order by map symbol and gives the capability classification of each. It also shows the page where each soil is described and the page for the woodland group and range site in which the soil has been placed.

Individual colored maps showing the relative suitability or degree of limitation of soils for many specific purposes can be developed by using the soil map and the information in the text. Translucent material can be used as an overlay over the soil map and colored to show soils that have the same limitation or suitability. For example, soils that have a slight limitation for a given use can be colored green, those with a moderate limitation can be colored yellow, and those with a severe limitation can be colored red.

Farmers and those who work with farmers can learn about use and management of the soils from the soil descriptions and from the discussions of the range sites and woodland groups.

Foresters and others can refer to the section "Woodland," where the soils of the county are grouped according to their suitability for trees.

Game managers, sportsmen, and others can find information about soils and wildlife in the section "Wildlife."

Ranchers and others can find, under "Range," groupings of the soils according to their suitability for range, and also the names of many of the plants that grow on each range site.

Community planners and others can read about the soil properties that affect the choice of sites for nonindustrial buildings and for recreation areas in the section "Nonfarm Uses of the Soils."

Engineers and builders can find, under "Engineering Uses of the Soils," tables that contain test data, estimates of soil properties, and information about soil features that affect engineering practices.

Scientists and others can read about how the soils formed and how they are classified in the section "Formation and Classification of the Soils."

Newcomers in Sequoyah County may be especially interested in the section "General Soil Map," where broad patterns of soils are described. They may also be interested in the information about the county given at the beginning of the publication.

Cover: **Improved pasture on an area of Linker soils. These soils are well drained.**

U.S. GOVERNMENT PRINTING OFFICE: 1970

For sale by the Superintendent of Documents, U.S. Government Printing Office
Washington, D.C. 20402

Contents

Issued June 1970

SOIL SURVEY OF SEQUOYAH COUNTY, OKLAHOMA

BY EDWARD J. ABERNATHY, SOIL CONSERVATION SERVICE

UNITED STATES DEPARTMENT OF AGRICULTURE, SOIL CONSERVATION SERVICE, IN COOPERATION WITH THE OKLAHOMA AGRICULTURAL EXPERIMENT STATION

SEQUOYAH COUNTY, in the east-central part of Oklahoma (fig. 1), has an area of 454,555 acres. Sallisaw, near the center of the county, is the county seat. It was incorporated in 1896, 11 years before Oklahoma became a State.

Livestock farming was the principal enterprise of the earliest settlers. After the coming of the railroads and the introduction of the cotton gin, corn and cotton became the main agricultural products. In the past 20 years the trend in farming has been away from cultivation and back to livestock farming. The areas still being cultivated are mainly on bottom lands along the Arkansas River. Much of the upland acreage that was formerly cultivated is now being planted to tame pasture. Other areas are being used for unimproved pasture. Many of the people now living on farms work at other jobs part time.

How This Soil Survey Was Made

Soil scientists made this survey to learn what kinds of soils are in Sequoyah County, where they are located, and how they can be used. They went into the county knowing they would likely find many soils they had already seen and perhaps some they had not. As they traveled over the county, they observed steepness, length, and shape of slopes; size and speed of streams; kinds of native plants or crops; kinds of rock; and many facts about the soils. They dug many holes to expose soil profiles. A profile is the sequence of natural layers, or horizons, in a soil; it extends from the surface down into the parent material that has not been changed much by leaching or by roots of plants.

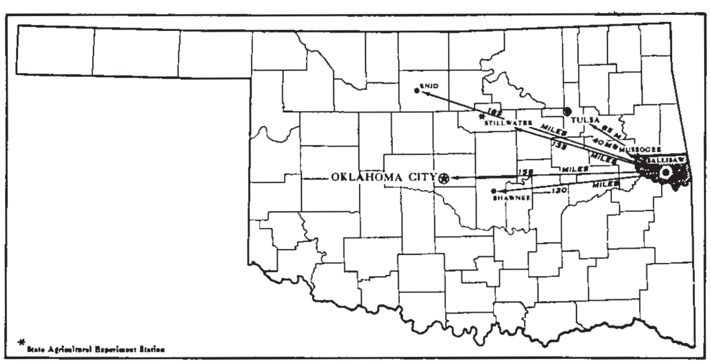


Figure 1.—**Location of Sequoyah County in Oklahoma.**

The soil scientists made comparisons among the profiles they studied, and they compared these profiles with those in counties nearby and in places more distant. They classified and named the soils according to nationwide, uniform procedures. To use this publication efficiently, it is necessary to know the kinds of groupings most used in a local soil classification.

Soils that have profiles almost alike make up a soil series. Except for different texture in the surface layer, the major horizons of all the soils of one series are similar in thickness, arrangement, and other important characteristics. Generally, each soil series is named for a town or other geographic feature near the place where a soil of that series was first observed and mapped. Lonoke and Stigler, for example, are the names of two soil series. All the soils in the United States having the same series names are essentially alike in natural characteristics.

Many soil series contain soils that differ in the texture of their surface layer. According to such differences in texture, separations called soil types are made. Within a series, all the soils having a surface layer of the same texture belong to one soil type. Lonoke loam and Lonoke silty clay loam are two soil types in the Lonoke series. The difference in texture of their surface layers is apparent from their names.

Some types vary so much in slope, degree of erosion, number and size of stones, or some other feature affecting their use that practical suggestions about their management could not be made if they were shown on the soil map as one unit. Such soil types are divided into phases, primarily on the basis of difference in slope or degree of erosion, because these are differences that affect management. For example, Stigler silt loam, 0 to 1 percent slopes, is one of several phases of Stigler silt loam.

After a guide for classifying and naming the soils had been worked out, the soil scientists drew the boundaries of the individual soils on aerial photographs. These photographs show woodlands, buildings, field borders, trees, and other details that help in drawing boundaries accurately. The soil map at the back of this publication was prepared from aerial photographs.

The areas shown on a soil map are called mapping units. On most maps detailed enough to be useful in planning management of farms and fields, a mapping unit is nearly equivalent to a soil type or a phase of a soil type. It is not exactly equivalent, because it is not practical to show on such a map all the small, scattered bits of soil of some other kind that have been seen within an area that is dominantly of a recognized soil type or soil phase.

In preparing some detailed maps, the soil scientists have a problem of delineating areas where different kinds of soils are so intricately mixed or occur in such small individual tracts that it is not practical to show them separately on the map. Such a mixture of soils is shown on the map as one mapping unit and is called a soil complex. Ordinarily, a complex is named for the major kinds of soil in it, for example, Linker-Hector complex, 2 to 5 percent slopes.

Another kind of mapping unit is the undifferentiated group, which consists of two or more soils that may occur together without regularity in pattern or relative proportion. The individual tracts of the component soils could be shown separately on the map, but the differences between the soils are so slight that the separation is not important for the objectives of the soil survey. An example is Linker and Stigler soils, 2 to 8 percent slopes, severely eroded.

Most surveys include areas where the soil material is so rocky, so shallow, or so frequently worked by wind and water that it cannot be classified by soil series. These areas are shown on the map like other mapping units, but they are given descriptive names, such as Strip mines, and are called land types.

While a soil survey is in progress, samples of soils are taken, as needed, for laboratory measurements and for engineering tests. Laboratory data from the same kinds of soils in other places are assembled. Data on yields of crops under defined practices are assembled from farm records and from field or plot experiments on the same kinds of soils. Yields under defined management are estimated for those soils that are suitable for cultivation.

But only part of a soil survey is done when the soils have been named, described, and delineated on the map, and the laboratory data and yield data have been assembled. The mass of detailed information then needs to be organized in such a way that it is readily useful to different groups of readers, among them farmers, ranchers, managers of woodland, engineers, and homeowners. Grouping soils that are similar in suitability for each specified use is the method of organization commonly used in soil surveys. On the basis of yield and practice tables and other data, the soil scientists set up trial groups. They test these groups by further study and by consultation with farmers, agronomists, engineers, and others, then adjust the groups according to the results of their studies and consultation. Thus, the groups that are finally evolved reflect up-to-date knowledge of the soils and their behavior under methods of use and management current at the time of this survey.

General Soil Map

The general soil map at the back of this survey shows, in color, the soil associations in Sequoyah County. A soil association is a landscape that has a distinctive proportional pattern of soils. It normally consists of one or more major soils and at least one minor soil, and it is named for the major soils. The soils in one association may occur in another, but in a different pattern.

A map showing soil associations is useful to people who want a general idea of the soils in a county, who want to compare different parts of a county, or who want to know the location of large tracts that are suitable for a certain kind of farming or other land use. Such a map is not suitable for planning the management of a farm or field, because the soils in any one association ordinarily differ in slope, depth, stoniness, drainage, and other characteristics that affect management.

The seven soil associations in this county are described in the following pages. The terms for texture used in the titles of several of the associations apply to the surface layer. For example, in the title of association 2, the word "loamy" refers to the texture of the surface layer.

1. Hector-Linker-Enders association

Sloping to steep, somewhat excessively drained to moderately well drained, stony soils that are very shallow to deep over sandstone or shale; on uplands

This association consists of sloping to steep, stony soils. It makes up about 50 percent of the county. Figure 2 shows a typical pattern of soils in associations 1, 2, and 5.

Each of the major soils makes up about a third of the total acreage, but the proportion varies from one area to another, and the positions of the soils on the landscape differ. Transition from one soil to another within short distances is common.

Hector soils are somewhat excessively drained. They have a surface layer of fine sandy loam and are underlain by sandstone at a depth of 8 to 20 inches.

Linker soils are well drained. They have a surface layer of loam and a reddish-yellow to brownish-yellow subsoil, dominantly clay loam. Sandstone is at a depth of 20 to 48 inches.

Enders soils, which formed in material weathered from shale, are deep and moderately well drained. They have a surface layer of fine sandy loam and a subsoil of red clay.

Small areas of very gently sloping to sloping Linker, Pickwick, and nonstony Hector soils occur in this association, generally along ridgetops. Rosebloom and Ennis soils occur in some bottom land areas.

This association is used mainly for wooded range. Much of the acreage belongs to absentee owners. There are a few large ranches, as much as 30,000 acres in size. Some of the areas produce hardwoods and pine of marketable quality. The association is not suited to cultivated crops or tame pasture, because the soils are stony and steep.

2. Linker-Pickwick-Stigler association

Deep to moderately deep, very gently sloping to sloping, well-drained and somewhat poorly drained, loamy soils on uplands

This association (see figs. 2 and 4) consists of very gently sloping to sloping soils. It is near or adjacent to association 1. It makes up about 28 percent of the county.

Linker soils, which formed in material weathered from sandstone, make up about 33 percent of the association. These soils are well drained and very gently sloping to sloping. They have a surface layer of loam and a reddish-yellow to brownish-yellow subsoil, dominantly clay loam. Sandstone is at a depth of 20 to 48 inches.

Pickwick soils, which are deeper over sandstone than Linker soils, make up about 15 percent of the association. These soils are well drained and very gently sloping to gently sloping. They have a surface layer of loam and a subsoil of dominantly reddish-yellow clay loam.

Stigler soils, which formed in shale residuum, alluvium,

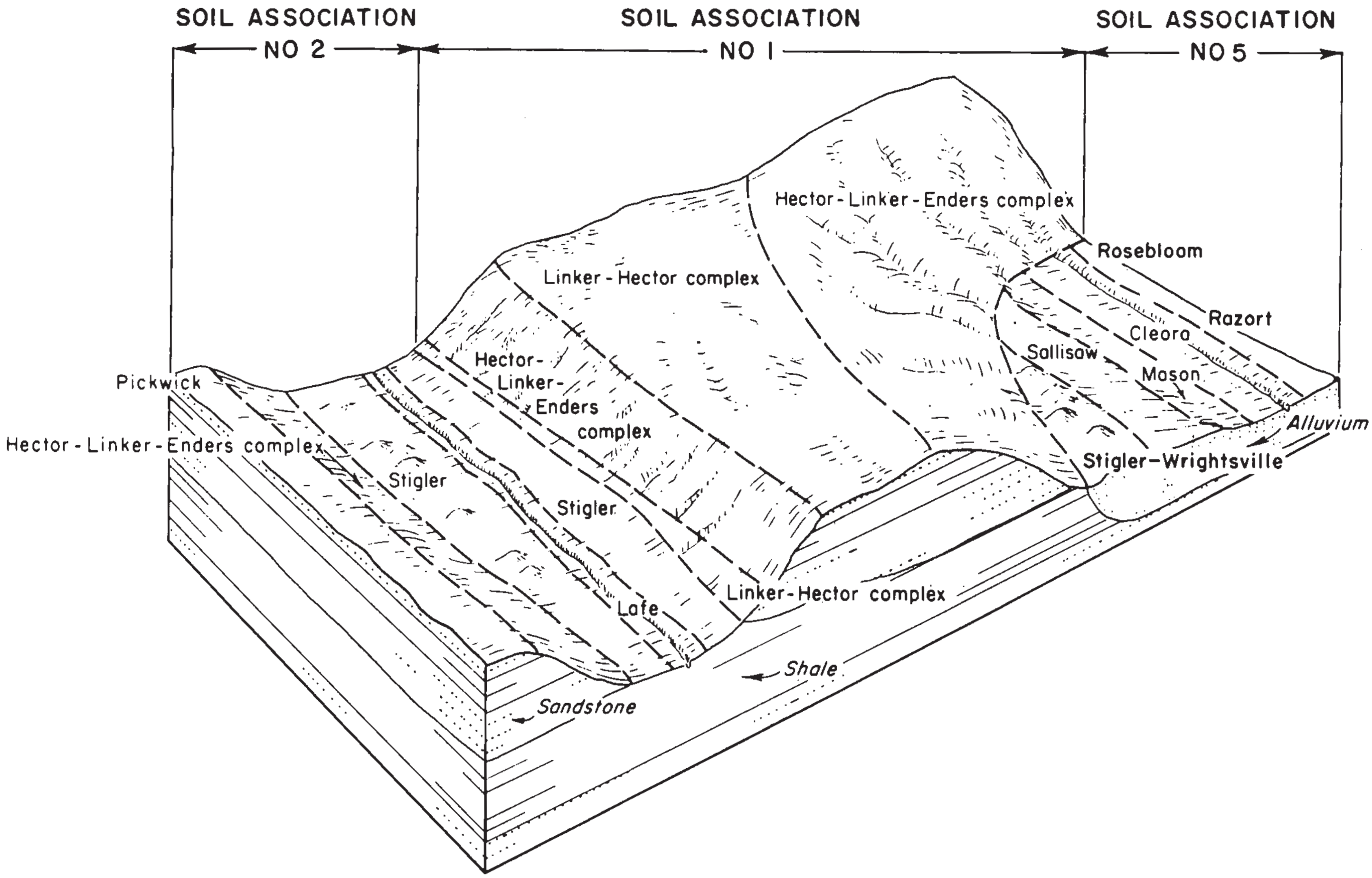


Figure 2.—**Typical pattern of soils in associations 1, 2, and 5.**

or loess, make up about 15 percent of the association. These soils are deep and somewhat poorly drained. They occur as mounded areas, generally on concave slopes. They have a surface layer of silt loam and a subsoil of very pale brown and brownish-yellow silty clay loam to clay.

About 37 percent of the association consists of small acreages of Hector, Rosebloom, Ennis, Lafe, and Sallisaw soils.

This association has been generally cleared and cultivated, and a small acreage is still used for cultivated crops, commonly truck crops and soybeans. About two-thirds can be cultivated, but much of this acreage is better suited to pasture, range, or woodland. Erosion or strong slopes make the rest unsuitable for cultivation. Farms range from 40 to 320 acres in size.

3. *Stigler-Vian-Spiro association*

Deep to moderately deep, nearly level to gently sloping, somewhat poorly drained to well-drained, loamy soils on uplands

This association consists mainly of nearly level to gently sloping, mounded soils, but partly of moderately steep, stony soils. It makes up about 10 percent of the county. Figure 3 shows a typical pattern of soils in association 3.

Stigler soils, which formed in shale alluvium or loess, make up about 55 percent of the association. These soils are deep, somewhat poorly drained, and nearly level to gently sloping. They have a surface layer of silt loam and a subsoil of very pale brown and brownish-yellow silty clay loam to clay.

Vian soils, which formed in alluvium or loess, make up about 15 percent of the association. These soils are deep, moderately well drained, and very gently sloping to gently sloping. They have a surface layer of silt loam and a subsoil of very pale brown and brownish-yellow silty clay loam.

Spiro soils, which formed in material weathered from interbedded sandstone, siltstone, and silty shale, make up about 10 percent of the association. These soils are well drained and very gently sloping to gently sloping. They have a surface layer of silt loam and a subsoil of light yellowish-brown light silty clay loam. Bedrock is at a depth of 20 to 48 inches.

Also in this association are areas of Collinsville complex, which consists of very shallow to shallow soils that formed in material weathered from sandstone and of deeper soils that formed in material weathered from shale. These soils have a stony surface layer and stones on the surface. Small areas of poorly drained Wrightsville soils occur with some of the areas of Stigler soils in this association. Soils of the Collinsville complex and Wrightsville soils make up about 20 percent of the association.

Athough about 90 percent of this association is suitable

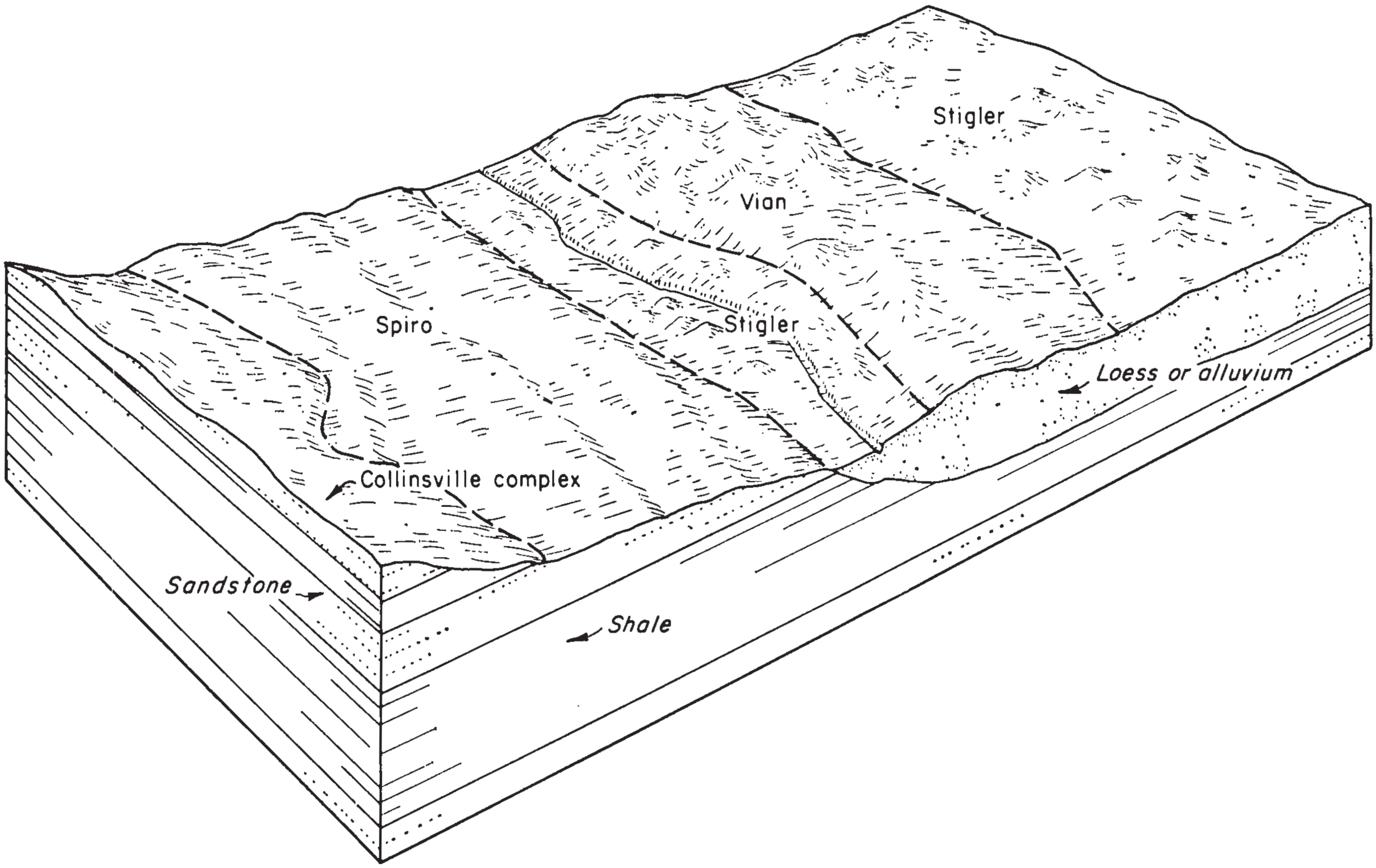


Figure 3.—**Typical pattern of soils in association 3.**

for cultivated crops, soil limitations necessitate careful management and restrict the use of the soils. Soils of the Collinsville complex are not suited to cultivated crops or tame pasture.

This association is used mainly for pasture, meadow, and native range. A few areas are cultivated. Soybeans are the principal cultivated crop. Farms range from 80 to 640 acres in size.

4. *Yahola-Lonoke-Brewer association*

Deep, level to undulating, well drained and moderately well drained, loamy soils on flood plains

This association consists of level to undulating soils along the Arkansas River, mostly along the southern boundary of the county. It makes up about 5 percent of the county. Figure 4 shows a typical pattern of soils in associations 2 and 4.

Yahola soils make up about 23 percent of the association. These soils are undulating, well drained, and calcareous. They are subject to occasional flooding. Typically, Yahola soils consist of brown and light-brown fine sandy loam to a depth of about 4 feet. They occur in areas close to the river channel.

Lonoke soils make up about 21 percent of the association. These soils are nearly level to gently sloping and are well drained. They are seldom flooded. Typically, Lonoke soils consist of brown and light-brown silty clay loam and heavy fine sandy loam to a depth of about 4 feet.

Brewer soils make up about 10 percent of the association. These soils are nearly level and moderately well drained. They occur in areas above common overflow. They have a surface layer of silt loam and a subsoil of dark-gray to grayish-brown silty clay loam.

The rest of the association consists of other soils in approximately the following percentages: Muldrow soils, 10 percent; Crevasse, 9 percent; Lela, 8 percent; Miller, 8 percent; Robinsonville, 7 percent; and Latanier, 4 percent.

Muldrow, Miller, and Lela soils are clayey and are somewhat poorly drained but seldom flooded. Latanier soils are clayey soils that are moderately well drained to poorly drained but seldom flooded. Robinsonville soils are well drained, moderately sandy soils that are seldom flooded. Crevasse soils are somewhat excessively drained, sandy soils that are subject to flooding.

The most fertile, most intensely cultivated soils in the county are in this association. Most of the acreage is cultivated. The principal crops are soybeans, small grain, alfalfa, spinach, cotton, and corn. A few areas are in woodland. The sandier soils near the river are not suitable for cultivation.

In about 30 percent of the association, the soils have only slight limitations that restrict their use. In about 50 percent of the association, soil limitations are moderate, and in about 10 percent, they are severe. In the remaining 10 percent of the association, soil limitations make the areas unsuitable for cultivation. Farms range from 40 to 640

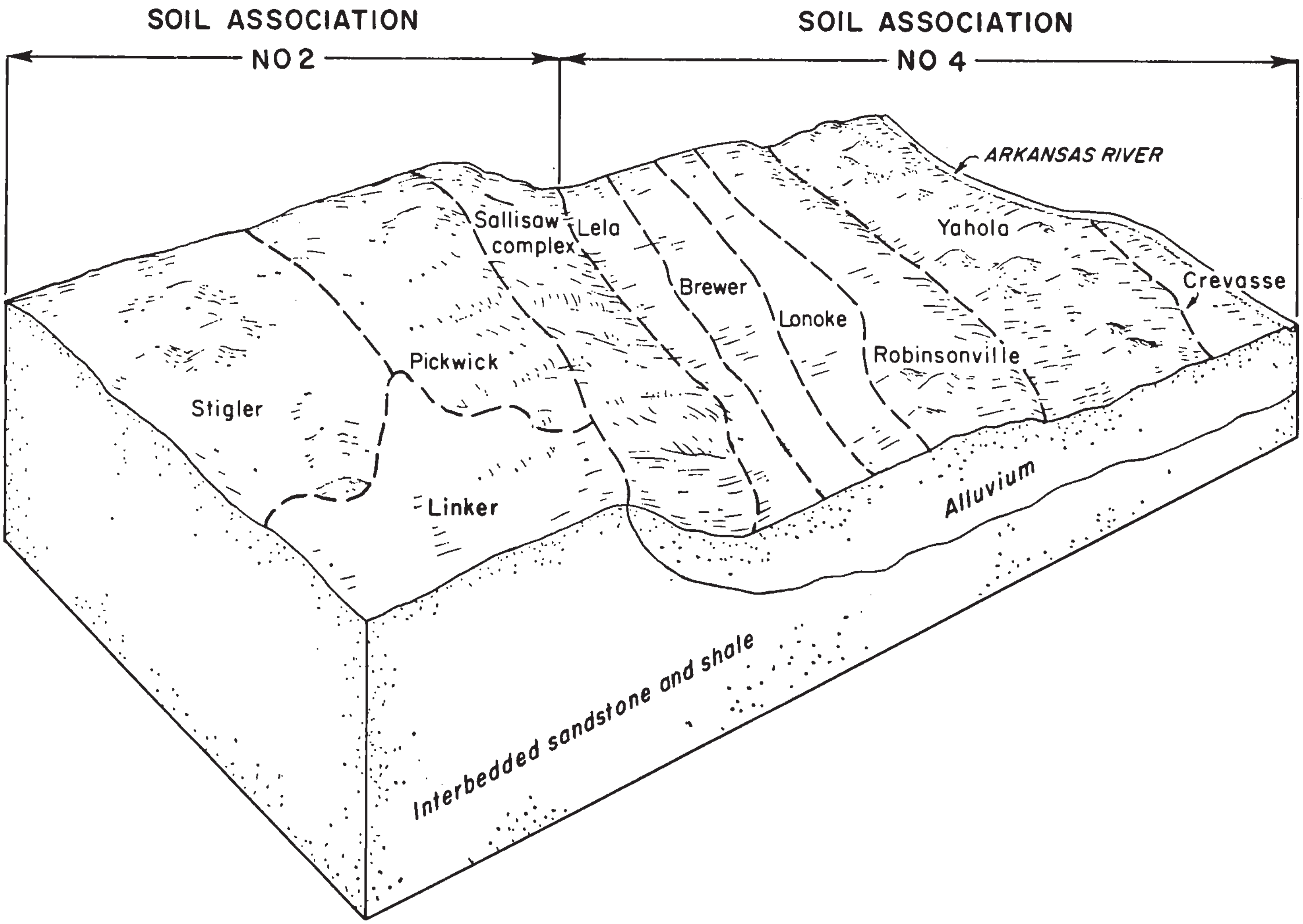


Figure 4.—**Typical pattern of soils in associations 2 and 4.**

acres in size. They are commonly operated by their owners or by lessees.

5. *Rosebloom-Mason association*

Deep, level to very gently sloping, poorly drained and well-drained, loamy soils on flood plains

This association (see fig. 2, p. 3) consists of level to very gently sloping soils on bottom lands along major streams other than the Arkansas River. It makes up about 5 percent of the county. The soils formed in alluvium washed from soils derived mainly from sandstone and shale but partly from limestone and chert.

Rosebloom soils make up about 55 percent of the association. These soils are nearly level and poorly drained. They have a surface layer of silt loam and a subsoil of gray silty clay loam. Some of the areas are flooded frequently.

Mason soils make up about 25 percent of the association. These soils are nearly level to very gently sloping and are well drained. They have a surface layer of brown silt loam and a subsoil of brown silty clay loam. They are subject to occasional flooding.

Also in this association are areas of Razort soils, which make up about 11 percent of the acreage, and Cleora soils, which make up about 9 percent. Razort soils have a surface layer of brown fine sandy loam and a subsoil of brown sandy clay loam. Cleora soils consist of brownish fine sandy loam throughout the profile.

Most of this association is used for cultivated crops, pasture, or meadow. Although about 55 percent of the acreage is suitable for cultivation, it is not commonly cultivated. About 25 percent has severe limitations for crops because of poor drainage, and about 20 percent is unsuitable, because of frequent flooding. Small grains and soybeans are the principal crops. Farms range from 80 to 320 acres in size.

6. *Bodine association*

Somewhat excessively drained, steep, stony and very cherty soils on uplands

This association consists of steep, stony and very cherty soils that occur in the north-central part of the county. It makes up about 1 percent of the county. The slope ranges from 15 to 50 percent.

Soils of the Bodine series are the only soils in this association. From 20 to 70 percent of the uppermost 20

inches of these soils is chert. Chert beds underlie the soil material.

This association is not suitable for cultivated crops or tame pasture. It is used for woodland range and for production of timber. A few small areas were formerly used for strawberries, but these areas have been allowed to revert to range.

7. Sogn-Summit association

Very gently sloping to steep, somewhat excessively drained and moderately well drained, loamy soils that are very shallow to deep over limestone; on uplands

This association consists of very gently sloping to steep upland soils in the north-central and northwestern parts of the county. It makes up about 1 percent of the county.

About two-thirds of the association consists of a complex of shallow to very shallow Sogn soils, and calcareous, deeper soils. Sogn soils have a surface layer of silty clay loam. They are underlain by limestone at a depth of 4 to 12 inches. Fragments of limestone are numerous on the surface. The slope ranges from 10 to 25 percent.

About a third of the association is made up of nonstony Summit soils. These are deep, moderately well drained soils that have a surface layer of silty clay loam and a subsoil of grayish heavy silty clay loam to silty clay. Summit soils occur on very gently sloping to gently sloping foot slopes. In places areas of the Hector-Linker-Enders association occur with these soils.

The Sogn complex in this association is not suitable for cultivation but is used for range. It is impractical to establish and maintain tame pasture, because the soils are steep and stony. The nonstony Summit soils are arable, and are used mainly for tame pasture and meadow. Farms range from 80 to 5,000 acres in size. Most of them are livestock farms.

Descriptions of the Soils

This section describes the soil series and mapping units of Sequoyah County. The approximate acreage and proportionate extent of each mapping unit are given in table 1.

In the pages that follow, a general description of each soil series is given. Each series contains a short description of a typical soil profile and a much more detailed description of the same profile that scientists, engineers, and others can use in making highly technical interpretations. The series description also contains a brief statement of the range in characteristics of the soils in the series, as mapped in this county. Following the series description, each mapping unit in the series in described individually. Color names and color symbols given are for dry soil, unless otherwise indicated. For full information on any one mapping unit, it is necessary to read the description of the soil series as well as the description of the mapping unit. The description of each mapping unit contains suggestions on how it can be managed. Miscellaneous land types, such as Strip mines, are described in alphabetic order along with other mapping units.

Following the name of each mapping unit is a symbol in parentheses. This symbol identifies the mapping unit on the detailed soil map. At the end of the description of each mapping unit are listed the capability unit, the range site, and the woodland group in which the mapping unit has been placed. The pages where the range sites and woodland groups are described can be readily learned by referring to the "Guide to Mapping Units."

For more general information about the soils, the reader can refer to the section "General Soil Map," in which the broad patterns of soils are described. Many of the terms used in the soil descriptions and other parts of the report are defined in the Glossary.

TABLE 1.—*Approximate acreage and proportionate extent of the soils*

Soil	Acres	Percent
Bodine stony silt loam, steep	2, 865	0. 6
Brewer silt loam	2, 458	. 5
Cleora fine sandy loam	2, 150	. 5
Collinsville complex, 5 to 20 percent slopes	3, 130	. 7
Crevasse soils	2, 444	. 5
Hector-Linker-Enders complex, 5 to 40 percent slopes	211, 660	46. 6
Lafe soils	1, 895	. 4
Latanier clay	930	. 2
Lela clay	1, 875	. 4
Linker-Hector complex, 2 to 5 percent slopes	37, 680	8. 3
Linker-Hector complex, 5 to 8 percent slopes	8, 545	1. 9
Linker and Stigler soils, 2 to 8 percent slopes, severely eroded	14, 009	3. 1
Lonoke loam, nearly level	5, 723	1. 3
Lonoke silty clay loam, level	1, 208	. 3
Lonoke silty clay loam, undulating	785	. 2
Mason silt loam	6, 180	1. 4
McKamie loam, 5 to 12 percent slopes	2, 235	. 5
Miller clay	635	. 1
Miller silty clay loam	1, 033	. 2
Muldrow silty clay loam	2, 523	. 6
Pickwick loam, 1 to 3 percent slopes	4, 495	1. 0
Pickwick loam, 3 to 5 percent slopes	7, 375	1. 6
Pickwick loam, 2 to 5 percent slopes, eroded	8, 205	1. 8
Razort fine sandy loam	2, 895	. 6
Robinsonville fine sandy loam, level	393	. 1
Robinsonville fine sandy loam, undulating	1, 533	0. 3
Rosebloom silt loam, occasionally flooded	5, 395	1. 2
Rosebloom silt loam, frequently flooded	4, 640	1. 0
Rosebloom and Ennis soils, broken	12, 072	2. 7
Sallisaw loam, 1 to 3 percent slopes	795	. 2
Sallisaw loam, 3 to 5 percent slopes	513	. 1
Sallisaw loam, 2 to 5 percent slopes, eroded	1, 255	. 3
Sallisaw complex, 8 to 30 percent slopes	2, 009	. 4
Sogn complex, 10 to 25 percent slopes	2, 600	. 6
Spiro silt loam, 2 to 5 percent slopes	4, 415	1. 0
Stigler silt loam, 0 to 1 percent slopes	3, 035	. 7
Stigler silt loam, 1 to 3 percent slopes	29, 843	6. 6
Stigler silt loam, 2 to 5 percent slopes, eroded	1, 155	. 3
Stigler-Wrightsville silt loams, 0 to 1 percent slopes	12, 495	2. 7
Strip mines	1, 075	. 2
Summit silty clay loam, 1 to 3 percent slopes	235	. 1
Summit silty clay loam, 3 to 5 percent slopes	630	. 1
Vian silt loam, 1 to 3 percent slopes	3, 890	. 8
Vian silt loam, 3 to 5 percent slopes	1, 560	. 3
Yahola fine sandy loam	4, 711	1. 0
Yahola complex	1, 026	. 2
Land area	428, 208	94. 2
Water area	26, 347	5. 8
Total	454, 555	100. 0

Bodine Series

The Bodine series consists of deep, rapidly permeable, somewhat excessively drained, stony soils on uplands. These soils occur only in the north-central part of the county. They formed in material weathered from chert. These are the only soils in the county that have a large amount of chert on the surface and throughout the profile.

Soils of the Bodine series typically have a surface layer that is light brownish-gray stony silt loam in the upper part and very pale brown very cherty silt loam in the lower part. Below this are chert beds that have interstices filled with red silty clay and very pale brown silt loam.

These areas are used for wooded range. The vegetation consists largely of low-quality mixed hardwoods and mid and tall native grasses. A few areas were formerly used for strawberries, but these have been allowed to revert to pasture.

Representative profile of Bodine stony silt loam, steep, 2,500 feet east and 2,300 feet north of the SW. corner of sec. 12, T. 13 N., R. 23 E.

A1—0 to 3 inches, light brownish-gray (10YR 6/2) stony silt loam, dark grayish brown (10YR 4/2) when moist; weak, fine, granular structure; friable when moist, slightly hard when dry; 30 percent angular chert fragments, mainly less than 3 inches in diameter; many chert fragments on the surface that are more than 10 inches in diameter; medium acid; clear, smooth boundary. 1 to 4 inches thick.

A2—3 to 20 inches, very pale brown (10YR 7/3) very cherty silt loam, yellowish brown (10YR 5/4) when moist; weak, fine, granular structure; friable when moist, slightly hard when dry; 50 percent angular chert fragments; very strongly acid; diffuse, wavy boundary. 11 to 35 inches thick.

B2t—20 to 55 inches +, chert beds with interstices filled with silty clay that is variegated red (2.5YR 5/6) to reddish brown (5YR 4/4) when dry, and very pale brown (10YR 7/3) silt loam; discontinuous clay films; 80 percent angular chert fragments; very strongly acid.

The amount of chert ranges from 15 to 75 percent on the surface, from 20 to 60 percent in the A1 horizon, from 30 to 70 percent in the A2 horizon, and from 60 to 90 percent in the B2t horizon. The color of the A1 horizon ranges from light brownish gray to grayish brown, and that of the A2 horizon, from very pale brown to brown. The B2t horizon is strongly acid to very strongly acid. Its texture ranges from heavy silty clay loam to silty clay. The depth to this horizon ranges from 15 to 36 inches.

Bodine stony silt loam, steep (BsF).—This is an upland soil that is stony on the surface and has a subsoil of stony silty clay. The slope ranges from 15 to 50 percent. Included in the areas mapped are small areas where limestone crops out, small areas where the surface layer is thinner than normal, and small areas where the amount of chert in the uppermost 30 inches of the profile is less than normal.

This soil is not suited to cultivated crops or tame pasture, because it is too stony and too steep. It is used mainly for wooded range. (Capability unit VIIs-3; woodland group 5; Steep Chert Savannah range site)

Brewer Series

The Brewer series consists of deep, slowly permeable, moderately well drained soils on bottom lands. These soils occur in the southern part of the county along the Arkansas River. They are seldom, if ever, flooded.

327-754—70——2

Soils of the Brewer series typically have a surface layer of grayish-brown silt loam and a subsoil of dark-gray silty clay loam that grades to grayish-brown heavy silty clay loam in the lower part.

Brewer soils are not extensive but are important for general farming. A few small areas support mixed hardwood forest.

Representative profile of Brewer silt loam, 325 feet west and 350 feet south of the NE. corner of NW¼ sec. 28, T. 11 N., R. 27 E.

A1—0 to 11 inches, grayish-brown (10YR 5/2) silt loam, very dark grayish brown (10YR 3/2) when moist; moderate, medium and fine, granular structure; friable when moist, hard when dry; slightly acid; gradual, smooth boundary. 7 to 15 inches thick.

B21t—11 to 39 inches, dark-gray (10YR 4/1) silty clay loam, very dark gray (10YR 3/1) when moist; moderate, medium and fine, subangular blocky structure; firm when moist, hard when dry; discontinuous clay films; neutral; diffuse, smooth boundary. 17 to 35 inches thick.

B22t—39 to 65 inches +, grayish-brown (10YR 5/2) heavy silty clay loam, very dark grayish brown (10YR 3/2) when moist; moderate, fine, subangular blocky structure; firm when moist, very hard when dry; discontinuous clay films; common, faint, strong-brown mottles; few, small, black concretions in the lower part; slightly acid.

The color of the A1 horizon ranges from grayish brown to dark grayish brown. The B2t horizon ranges from grayish brown to very dark gray in color and from medium silty clay loam to heavy silty clay loam in texture. Reaction throughout the solum ranges from slightly acid to neutral.

Brewer soils have a lower content of clay at comparable depths than Muldrow soils, and are free of mottling to a greater depth. They are grayer and more clayey at a depth between 10 and 40 inches than soils of the Lonoke and Mason series.

Brewer silt loam (0 to 1 percent slopes) (Bw).—This soil occurs on bottom lands along the Arkansas River. It has a subsoil of silty clay loam. Included in the areas mapped are areas of clay loam and small areas of Lonoke loam, nearly level, and of Muldrow silty clay loam.

This soil is well suited to alfalfa, corn, cotton, small grain, sorghum, soybeans, spinach (fig. 5), and tame pasture. It is suitable for irrigation. Tillage is easy, and the natural fertility is moderate to high.

The principal management problems are maintenance of structure and fertility. Growing small grain year after

Figure 5.—Spinach on Brewer silt loam. This is one of the most productive soils in the county. It is in capability unit I-1.

year, double cropped with soybeans and using the residue for soil maintenance, is an example of a suitable cropping system. Crops respond well to fertilization and other good management practices. (Capability unit I-1; woodland group 3)

Cleora Series

The Cleora series consists of deep, moderately rapidly permeable, well-drained soils on bottom lands. These soils occur mainly in the central and eastern parts of the county along major streams other than the Arkansas River. They are flooded occasionally.

Soils of the Cleora series typically consist of brown fine sandy loam in the upper part and light yellowish-brown fine sandy loam below a depth of about 30 inches.

These soils are not extensive but are important for farming. They are used mainly for tame pasture and meadow. Some areas support mixed hardwood forest.

Representative profile of Cleora fine sandy loam, 1,100 feet north and 900 feet east of the SW. corner of sec. 24, T. 11 N., R. 25 E.

Ap—0 to 7 inches, brown (10YR 5/3) fine sandy loam, dark brown (10YR 3/3) when moist; weak, fine, granular structure; very friable when moist, slightly hard when dry; medium acid; clear, smooth boundary. 6 to 10 inches thick.

A1—7 to 15 inches, brown (10YR 5/3) fine sandy loam, dark brown (10YR 3/3) when moist; weak, fine, granular structure; friable when moist, slightly hard when dry; medium acid; gradual, smooth boundary. 4 to 14 inches thick.

C1—15 to 30 inches, brown (10YR 5/3) fine sandy loam, dark brown (10YR 4/3) when moist; massive; very friable when moist, slightly hard when dry; a few thin strata of pale-brown fine sandy loam; medium acid; gradual, wavy boundary. 6 to 30 inches thick.

C2—30 to 70 inches +, light yellowish-brown (10YR 6/4) fine sandy loam, dark yellowish brown (10YR 4/4) when moist; massive; very friable when moist, slightly hard when dry; thin strata of very pale brown fine sandy loam; medium acid.

The average texture throughout the profile is fine sandy loam. The reaction is medium acid to slightly acid. The color of the A horizon ranges from yellowish brown to dark grayish brown, and that of the C1 and C2 horizons, from light brown or light yellowish brown to brown. The C2 horizon is in the lighter part of the color range in most places.

Cleora soils are more acid than Yahola soils. They have a darker colored surface layer than Robinsonville soils, and their substratum is not so sandy as that of those soils.

Cleora fine sandy loam (0 to 2 percent slopes) (Ce).—This soil is deep and well drained. Included in the areas mapped are small areas of Razort fine sandy loam and small areas where the slope is 3 to 4 percent.

This soil is well suited to corn, cotton, small grain, sorghum, soybeans, and tame pasture. Irrigation is beneficial in years when precipitation is below normal. Tillage is easy, and the natural fertility is moderate.

The principal management problems are maintenance of soil structure and fertility. Growing alfalfa 3 to 5 years, then spinach, is an example of a suitable cropping system. If large amounts of nonleguminous residue are used, nitrogen is needed to hasten decomposition. Crops respond well to fertilization. (Capability unit I-2; woodland group 2)

Collinsville Series

The Collinsville series consists of very shallow to shallow, moderately rapidly permeable, well-drained soils on uplands. These soils occur in small areas throughout the southern part of the county. They formed in material weathered from sandstone.

Soils of the Collinsville series typically have a surface layer of grayish-brown fine sandy loam. Below this is a thin layer of sandstone and light brownish-gray fine sandy loam. Acid sandstone is at a depth of about 10 inches.

These soils are mostly in native grasses. Scrub elm and hawthorn grow in some areas.

Representative profile of Collinsville fine sandy loam, 2,450 feet north and 50 feet west of the SE. corner of sec. 8, T. 11 N., R. 23 E.

A1—0 to 7 inches, grayish-brown (10YR 5/2) fine sandy loam, dark brown (10YR 3/3) when moist; moderate, medium and fine, granular structure; friable when moist, slightly hard when dry; many fragments of sandstone; strongly acid; clear, wavy boundary. 4 to 10 inches thick.

R&C—7 to 10 inches, sandstone and light brownish-gray (10YR 6/2) fine sandy loam, dark grayish brown (10YR 4/2) when moist; 75 percent is sandstone, and 25 percent is fine sandy loam; massive; very strongly acid; clear, irregular boundary. 2 to 4 inches thick.

R—10 to 20 inches +, sandstone.

The A1 horizon ranges from fine sandy loam to light loam but is dominantly fine sandy loam. It is strongly acid to slightly acid. The color is brown to dark grayish brown. Bedrock begins at a depth of 4 to 12 inches. It ranges from fine-grained, thin, platy sandstone to coarse-grained, massive sandstone.

Collinsville soils have a thicker A1 horizon than Hector soils, but they lack the A2 horizon of those soils.

Collinsville complex, 5 to 20 percent slopes (CnE).—This complex consists of Collinsville soils and deeper, more strongly developed soils. About 45 percent of the acreage consists of Collinsville soils, about 40 percent of deeper soils that have a fine-textured subsoil, and about 15 percent of Spiro and similar soils. Sandstone fragments, mostly between 3 inches and 2 feet in diameter, cover 5 to 50 percent of the surface.

The Collinsville soils, which are very shallow to shallow, are fine sandy loam or light loam. The other soils in the complex have a surface layer of brown to dark grayish-brown loam or light loam overlying a finer textured subsoil. The texture range of the upper part of the subsoil includes heavy clay loam, heavy silty clay loam, light silty clay, and light clay. The color range is generally reddish yellow to reddish brown, but in a few places the soil material is very pale brown and contains many, distinct, light-red and gray mottles. Gray mottling increases with depth. The lower part of the subsoil is dominantly light gray, or gray mottled with red and yellowish brown. The subsoil is very strongly acid to strongly acid. In most places the substratum is shale, but it ranges to interbedded clay and siltstone. The depth to the substratum ranges from 24 to 48 inches.

This complex is not suitable for cultivated crops or tame pasture, because the soils are shallow, stony, and moderately steep, but it is suitable for range. The vegetation consists of native grasses and a few scrub elm and hawthorn trees. An adequate cover of vegetation is needed to control erosion. (Capability unit VIIs-1; Collinsville soils are in the Shallow Prairie range site; the deeper soils are in the Loamy Prairie range site)

Crevasse Series

The Crevasse series consists of deep, rapidly permeable, somewhat excessively drained, sandy soils on bottom lands. These soils occur on flood plains along the Arkansas River. They are subject to flooding.

Soils of the Crevasse series typically have a surface layer of pale-brown loamy fine sand and a substratum of very pale brown fine sand.

Crevasse soils are not extensive. Most of the acreage is in woodland or tame pasture. Some areas, where deposition has been more recent, are in tamarack and willow.

Representative profile of a Crevasse loamy fine sand, 1,000 feet east and 800 feet south of the NW. corner of sec. 34, T. 11 N., R. 27 E.

A1—0 to 10 inches, pale-brown (10YR 6/3) light loamy fine sand, brown (10YR 5/3) when moist; single grain; loose when either moist or dry; calcareous; gradual smooth boundary. 8 to 20 inches thick.

C—10 to 70 inches +, very pale brown (10YR 7/3) fine sand, brown (10YR 5/3) when moist; single grain; loose when either moist or dry; calcareous.

The A1 horizon is very pale brown to pale brown. Its texture ranges from loamy fine sand to fine sand within short distances. The texture of the C horizon is fine sand in most places but ranges to loamy fine sand. Thin, stratified layers of fine sandy loam to silty clay loam begin below a depth of 36 inches in some profiles. In areas where the C horizon is stratified, the average texture is loamy fine sand. The reaction throughout the profile ranges from mildly alkaline to moderately alkaline.

Soils of the Crevasse series are sandier throughout than soils of the Cleora, Robinsonville, and Yahola series.

Crevasse soils (0 to 3 percent slopes) (Cr).—These soils are deep and sandy. They occur on bottom lands and are subject to flooding. The slopes are short and irregular. Included in the areas mapped are small areas of fine sandy loam and small areas of Yahola fine sandy loam.

These soils are suited to pasture or woodland. Bermudagrass and johnsongrass grow fairly well. Cool-season legumes are better suited than warm-season legumes because moisture conditions are generally more favorable in winter and spring. The natural fertility is moderate. Tillage is difficult.

Brush control and weed control are needed on tame pasture. Fertilization is normally beneficial. Lime is not needed. (Capability unit IVs-1; woodland group 2)

Enders Series

The Enders series consists of deep, slowly permeable, moderately well drained, sloping to steep soils on uplands. These soils occur on side slopes. They developed in material weathered from shale. In Sequoyah County, Enders soils are mapped only in a complex with Hector and Linker soils.

Soils of the Enders series typically have a surface layer of fine sandy loam that is grayish brown in the upper part and very pale brown in the lower part. The subsoil is red clay that is mottled in the lower part. Shale is at a depth of about 40 inches.

These soils are extensive in the northern part of the county, but they are not important for farming. They are mostly in hardwood forest. A few areas produce pine.

Representative profile of Enders fine sandy loam, 950 feet east and 425 feet south of the NW. corner of sec. 10, T. 12 N., R. 23 E.

A1—0 to 3 inches, grayish-brown (10YR 5/2) fine sandy loam, very dark grayish brown (10YR 3/2) when moist; weak, fine, granular structure; very friable when moist; slightly hard when dry; many sandstone pebbles; medium acid; gradual, smooth boundary. 1 to 4 inches thick.

A2—3 to 7 inches, very pale brown (10YR 7/3) fine sandy loam, brown (10YR 5/3) when moist; weak, fine, granular structure; very friable when moist, slightly hard when dry; numerous sandstone pebbles; medium acid; clear, wavy boundary. 2 to 6 inches thick.

B21t—7 to 16 inches, red (2.5YR 5/8) clay, red (2.5YR 4/8) when moist; strong, very fine and fine, blocky structure; firm when moist, hard when dry; few sandstone pebbles; numerous clay films; very strongly acid; gradual, smooth boundary. 7 to 13 inches thick.

B22t—16 to 26 inches, light-red (2.5YR 6/8) clay, red (2.5YR 5/8) when moist; strong, very fine and fine, blocky structure; firm when moist, hard when dry; numerous clay films; many, fine, distinct, pale-brown mottles; few shale fragments and sandstone pebbles; very strongly acid; gradual, smooth boundary. 5 to 12 inches thick.

B3—26 to 40 inches, mottled very pale brown (10YR 7/3), red (2.5YR 4/6), and light-gray (10YR 7/1) clay; weak, fine, blocky structure; firm when moist, hard when dry; numerous shale fragments; very strongly acid; gradual, smooth boundary. 11 to 20 inches thick.

R—40 to 70 inches +, yellowish-brown, light-gray, and dark-gray shale; very strongly acid.

The color of the A1 horizon ranges from pale brown to grayish brown, and that of the A2 horizon, from very pale brown to pale brown. The texture of the A horizon is fine sandy loam in most places but ranges to light loam. The B21t horizon ranges from light red to reddish brown or yellowish red. It is strongly acid to very strongly acid. The depth to shale ranges from 30 to 55 inches; in some places the depth varies considerably within short distances.

Enders soils have a more clayey B2t horizon than Linker and Pickwick soils.

Ennis Series

The Ennis series consists of deep, moderately permeable, well-drained soils on bottom lands. These soils occur throughout the county along small drainageways. In Sequoyah County, Ennis soils are mapped only with Rosebloom soils.

Soils of the Ennis series typically have a surface layer of pale-brown silt loam and a subsoil of light yellowish-brown heavy silt loam. They are mottled with gray at varying depths below a depth of 30 inches.

These soils are in mixed hardwood forest or in pasture.

Representative profile of Ennis silt loam, 1,450 feet west and 50 feet south of the NE. corner of sec. 6, T. 11 N., R. 23 E.

A1—0 to 11 inches, pale-brown (10YR 6/3) silt loam, brown (10YR 4/3) when moist; weak, fine, granular structure; friable when moist, hard when dry; medium acid; gradual, smooth boundary. 7 to 13 inches thick.

B21—11 to 34 inches, light yellowish-brown (10YR 6/4) heavy silt loam, dark yellowish brown (10YR 4/4) when moist; weak, very fine, subangular blocky structure; friable when moist, hard when dry; few patchy clay films, mainly in pores; strongly acid; gradual, smooth boundary. 18 to 35 inches thick.

B22—34 to 65 inches +, light yellowish-brown (10YR 6/4) heavy silt loam, dark yellowish brown (10YR 4/4) when moist; weak, very fine, subangular blocky structure; friable when moist, hard when dry; common, distinct, light brownish-gray mottles; few patchy clay films, mainly in pores; strongly acid.

The A1 horizon ranges from loam to silt loam in texture and from very pale brown to light brownish gray in color. The B2

horizon ranges from heavy silt loam to light silty clay loam in texture and from yellow to pale brown in color. It is very strongly acid to strongly acid. No mottles that have a chroma of 1 or 2 occur in the uppermost 30 inches of the profile.

Ennis soils have lighter colored upper horizons than Mason soils and are commonly more acid than those soils. They are better drained and less grayish in the uppermost 30 inches than Rosebloom soils.

Hector Series

The Hector series consists of very shallow to shallow, rapidly permeable, somewhat excessively drained soils on uplands. These soils occur on ridgetops and side slopes throughout the county, but mainly in the northern part. They formed in material weathered from sandstone (fig. 6). In Sequoyah County, Hector soils are mapped only in complexes with Linker and Enders soils.

Soils of the Hector series typically have a surface layer of fine sandy loam that is grayish brown in the upper part and light yellowish brown in the lower part. Below this is a layer of fine sandy loam mixed with sandstone. Sandstone is at a depth of about 14 inches.

These soils are mostly in hardwood forest. Pine and cedar grow in a few places. Some of the more gently sloping areas are used for general farming, tame pasture, and meadow.

Representative profile of a Hector fine sandy loam, 2,000 feet north and 300 feet west of the SE. corner of sec. 25, T. 11 N., R. 23 E.

A1—0 to 4 inches, grayish-brown (10YR 5/2) fine sandy loam, dark grayish brown (10YR 4/2) when moist; weak, fine, granular structure; very friable when moist, slightly hard when dry; medium acid; clear, smooth boundary. 1 to 5 inches thick.

A2—4 to 10 inches, light yellowish-brown (10YR 6/4) fine sandy loam, dark yellowish brown (10YR 4/4) when moist; weak, fine, granular structure; very friable when moist, slightly hard when dry; strongly acid; clear, irregular boundary. 4 to 12 inches thick.

A2&R—10 to 14 inches, broken soft and hard sandstone; interstices, constituting 30 to 50 percent of the layer, are filled with light yellowish-brown fine sandy loam. 0 to 6 inches thick.

R—14 to 20 inches +, sandstone.

The color of the A1 horizon ranges from pale brown to grayish brown, and that of the A2 horizon, from very pale brown to pale brown or light brown. The texture throughout the solum is commonly fine sandy loam, but it ranges to light loam. The soils are very strongly acid to medium acid. The depth to bedrock ranges from 8 to 20 inches.

Hector soils have a thinner A1 horizon than Collinsville soils, and they have an A2 horizon, which is lacking in those soils.

Hector-Linker-Enders complex, 5 to 40 percent slopes (HeF).—The soils in this complex are stony and very shallow to deep. Each makes up about a third of the total acreage, but the proportions vary from one area to another. Any one of them may make up 15 to 40 percent of any given area. Rocks and stones cover 5 to 50 percent of the surface. They range from 3 inches in diameter to the size of large boulders, but are commonly between 6 inches and 2 feet in diameter. In most places the Linker soils in this complex have an A1 and A2 horizon and their solum is 20 to 36 inches thick. Included in the areas mapped are small areas of rock escarpments, small areas where the slope is 3 to 5 percent, and small areas of a Linker loam that has no sandstone fragments on the surface.

This complex is not suited to cultivated crops or tame pasture. It is suited to range and woodland. The vegetation consists of pine and hardwoods of moderately good to low quality and of native grasses. Erosion can be controlled by maintaining a good plant cover. (Capability unit VIIs–2; woodland group 6; Shallow Savannah and Sandy Savannah range sites)

Figure 6.—**An area of Hector soils, showing the horizontally bedded underlying sandstone.**

Lafe Series

The Lafe series consists of deep, very slowly permeable, somewhat poorly drained soils on uplands. These soils occur along small natural drainageways, mainly in the central part of the county. They formed in local sediments or in material weathered from shale.

Soils of the Lafe series typically have a surface layer of silt loam that is pale brown in the upper part and very pale brown in the lower part. The subsoil consists of pale-brown to yellowish-brown and brownish-yellow clay. The exchangeable sodium content is high. Gray mottles occur in the subsoil and increase in number with depth. Shale is at a depth of about 55 inches.

Lafe soils are not extensive. They are used mainly for native range and tame pasture. There are scattered hardwood trees in some areas.

Representative profile of Lafe silt loam, 125 feet south and 100 feet east of the NW. corner of sec. 6, T. 11 N., R. 25 E.

A11—0 to 1 inch, pale-brown (10YR 6/3) silt loam, brown (10YR 4/3) when moist; strong, thin, platy structure; friable when moist, hard when dry; strongly acid; clear, smooth boundary. ½ inch to 2 inches thick.

A12—1 to 4 inches, pale-brown (10YR 6/3) silt loam, brown (10YR 4/3) when moist; weak, thin, platy structure; friable when moist, hard when dry; medium acid; clear, smooth boundary. 3 to 6 inches thick.

A2—4 to 7 inches, very pale brown (10YR 7/4) silt loam, yellowish brown (10YR 5/4) when moist; massive; friable when moist, very hard when dry; common, small, yellowish-brown and black concretions; neutral; clear boundary. 2 to 7 inches thick where present.

B21t—7 to 15 inches, pale-brown (10YR 6/3) clay, brown (10YR 4/3) when moist; moderate, medium and

coarse, columnar structure breaking to moderate, medium and fine, blocky; very firm when moist, very hard when dry; few, distinct, dark grayish-brown mottles; few yellowish-brown and black concretions; discontinuous clay films; neutral; dark-brown coatings on some ped faces; gradual, smooth boundary. 6 to 9 inches thick.

B22t—15 to 38 inches, light yellowish-brown (10YR 6/4) clay, yellowish brown (10YR 5/4) when moist; weak, fine, blocky structure; very firm when moist, very hard when dry; discontinuous clay films; common, distinct, grayish-brown mottles; numerous small pockets of salt crystals; few, small, yellowish-brown and black concretions; mildly alkaline; gradual, smooth boundary. 10 to 30 inches thick.

B3—38 to 55 inches, brownish-yellow (10YR 6/6) clay, yellowish brown (10YR 5/6) when moist; weak, fine, blocky structure; very firm when moist, very hard when dry; few clay films; many, distinct, light-gray mottles; strongly alkaline and locally calcareous; clear, irregular boundary. 10 to 30 inches thick.

R—55 to 60 inches +, yellowish-brown, gray, and black alkaline shale that is locally calcareous.

The A1 horizon ranges from silt loam to loam in texture and from light yellowish brown to grayish brown in color. The A2 horizon, where it occurs, ranges from silt loam to loam in texture and from very pale brown to light gray in color. The boundary between the A and B21t horizons is clear to abrupt. The B2t horizon ranges from heavy silty clay loam to clay in texture and from light yellowish brown to light brownish gray in color. It is neutral to alkaline. Shale begins at a depth of 40 to 84 inches.

Lafe soils have a thinner A horizon than Stigler soils and a higher percentage of exchangeable sodium in the upper part of the subsoil.

Lafe soils (0 to 2 percent slopes) (La).—These soils occur near small natural drainageways. About 70 percent of the acreage consists of Lafe soils; 20 percent of Stigler silt loam, 0 to 3 percent slopes; and 10 percent of soils that have characteristics intermediate between Lafe and Stigler soils. Included in the areas mapped are mounded areas where the surface layer is more than 30 inches thick.

These soils absorb water very slowly and hold only a limited amount of moisture. Consequently, they are very dry in summer. The surface crusts over in many of the areas where the surface layer is thin. The plant cover is generally sparse, and the soils are highly susceptible to water erosion.

These soils are not suited to cultivated crops. Yields from native and tame pastures are low. Fertilization of tame pasture plants is beneficial. (Capability unit VIs–1; Slickspot range site)

Latanier Series

The Latanier series consists of deep, moderately well drained to somewhat poorly drained soils on bottom lands. These soils occur in the southeastern part of the county along the Arkansas River. They are seldom flooded. Permeability is very slow in the surface layer but is moderate to moderately rapid in the substratum.

Soils of the Latanier series typically have a surface layer of reddish-brown clay and a substratum of reddish-brown silty clay loam. Pink very fine sandy loam begins at a depth of about 23 inches, and loamy very fine sand, at a depth of about 44 inches.

These soils are not extensive, but they are used intensively for general farming. A few small areas are in mixed hardwood forest.

Representative profile of Latanier clay, 1,550 feet south and 1,250 feet east of the NW. corner of sec. 11, T. 10 N., R. 26 E.

Ap—0 to 9 inches, reddish-brown (5YR 5/3) clay, dark reddish brown (5YR 3/3) when moist; weak, very fine, blocky structure; very firm when moist, very hard when dry; neutral; clear, wavy boundary. 6 to 11 inches thick.

A1—9 to 17 inches, reddish-brown (5YR 5/3) clay, dark reddish brown (5YR 3/3) when moist; moderate, fine, blocky structure; very firm when moist, very hard when dry; neutral; gradual, wavy boundary. 4 to 16 inches thick.

C1—17 to 23 inches, reddish-brown (5YR 5/3) silty clay loam, reddish brown (5YR 4/3) when moist; weak, fine, subangular blocky structure; firm when moist, hard when dry; few thin strata of light reddish-brown very fine sandy loam; calcareous; numerous small concretions of calcium carbonate; gradual, wavy boundary. 3 to 8 inches thick.

IIC2—23 to 44 inches, pink (7.5YR 7/4) very fine sandy loam, brown (7.5YR 5/4) when moist; massive; very friable when moist, slightly hard when dry; mildly alkaline; gradual, wavy boundary. 15 to 30 inches thick.

IIIC3—44 to 70 inches +, pink (7.5YR 7/4) loamy very fine sand, brown (7.5YR 5/4) when moist; massive; very friable when moist, slightly hard when dry; calcareous.

The Ap horizon is dominantly clay, but its texture ranges to silty clay. Its color ranges from brown or reddish brown to dark brown or dark reddish gray. The A1 horizon ranges from silty clay to clay in texture and from reddish brown to dark reddish gray in color. The A horizon ranges from 15 to 24 inches in thickness. Some profiles lack a C1 horizon. The color of the IIC2 horizon ranges from pink to brown. Where present, the IIIC3 horizon begins at a depth of 40 to 60 inches. In some places the lower part of this horizon is very fine sandy loam. In some places the IIC2 and IIIC3 horizons contain thin strata of silty clay loam. The Ap horizon is neutral to mildly alkaline. The A1, C1, and IIC2 horizons are neutral to moderately alkaline. The IIIC3 horizon is calcareous in most places.

The layer of clay in Latanier soils is thinner than the layer of clay in Miller and Lela soils. Latanier soils have a more clayey surface layer than Lonoke soils.

Latanier clay (0 to 1 percent slopes) (Lc).—This is a deep soil that has a clay surface layer and a loamy substratum. Included in the areas mapped are small areas of Miller clay and Lonoke silty clay loam, level. Also included are areas where the clay surface layer is only 10 to 15 inches thick and small areas where the slope is 1 to 2 percent.

This soil is suited to small grain and soybeans. The natural fertility is moderately high to high.

The principal management problems are maintenance of structure and fertility. Wheat year after year is a suitable cropping system if the residue is used to maintain structure and fertility. Because of the clay texture and seasonal wetness, this soil should be tilled only within a narrow range of moisture content. Surface drainage is beneficial in some places. Crops respond well to fertilization. Lime is not needed in most places. (Capability unit IIs–2; woodland group 1)

Lela Series

The Lela series consists of deep, very slowly permeable, somewhat poorly drained, nearly level soils on bottom lands. These soils occur along the Arkansas River in the southeastern part of the county. They are seldom flooded.

Soils of the Lela series typically have a surface layer of dark-gray silty clay, a subsurface layer of gray silty clay, and, at a depth of nearly 5 feet, a layer of reddish-brown silty clay.

These soils are not extensive, but they are fairly important for general farming. A few areas support hardwood forest.

Representative profile of Lela clay, 1,100 feet south and 100 feet east of the NW. corner of sec. 21, T. 11 N., R. 27 E.

A11—0 to 18 inches, dark-gray (10YR 4/1) clay, black (10YR 2/1) when moist; weak, very fine, blocky structure; very firm when moist, very hard when dry; slightly acid; gradual, smooth boundary. 8 to 30 inches thick.

A12—18 to 57 inches, gray (10YR 5/1) silty clay, very dark gray (10YR 3/1) when moist; weak, fine, blocky structure; very firm when moist, extremely hard when dry; few, coarse, distinct, brown and reddish-brown mottles; neutral; diffuse, smooth boundary. 30 inches to more than 60 inches thick.

AC—57 to 70 inches +, reddish-brown (5YR 4/3) silty clay, dark reddish brown (5YR 3/3) when moist; weak, fine, blocky structure; extremely firm when moist, extremely hard when dry; few, distinct, dark-gray mottles; mildly alkaline.

The A11 horizon is dominantly clay but ranges from silty clay to clay. It is grayish brown to dark gray in color, and in some places it has a few yellowish-brown or reddish-brown mottles. It is slightly acid to neutral. The A12 horizon ranges from clay to silty clay in texture and from grayish brown to dark gray in color. This horizon is slightly acid to mildly alkaline. The AC horizon ranges from mildly alkaline to moderately alkaline.

Lela soils are grayer than Miller soils, and they lack the sandy substrata of Miller soils. They are more clayey in the upper 15 to 30 inches of the profile than Muldrow soils.

Lela clay (0 to 1 percent slopes) (Lm).—This soil is deep and somewhat poorly drained. Included in the areas mapped are small areas of Muldrow silty clay loam.

This soil is suited to soybeans, small grains, pecans, and such tame pasture plants as tall fescue. The natural fertility is moderately high.

Because of the clay texture and seasonal wetness, this soil should be tilled only within a narrow range of moisture content. An example of a suitable cropping system is double cropping small grain with soybeans. Adequate amounts of fertilizer should be applied, and the crop residue should be used for maintenance of structure and fertility. Crops respond to fertilization. Surface drainage (fig. 7) is needed in most places. (Capability unit IIIw-1; woodland group 1)

Linker Series

The Linker series consists of moderately deep to deep, moderately permeable, well-drained soils on uplands. These soils occur on ridgetops and side slopes throughout the county. They formed in material weathered from sandstone. In Sequoyah County, Linker soils are mapped in complexes or undifferentiated units with Enders, Hector, and Stigler soils.

Soils of the Linker series typically have a surface layer of light yellowish-brown light loam. The upper part of the subsoil is reddish-yellow loam over light clay loam, and the lower part is mottled brownish-yellow, light-gray, and red light clay loam. Sandstone is at a depth of about 26 inches.

These soils are important for pasture. Gently sloping areas are used for general farming, tame pasture, and meadow. Virgin areas support open forest in which some mid and tall native grasses grow. Most of the trees are hardwoods. A few stands of pine occur in the eastern part of the county.

Representative profile of Linker loam, 2,400 feet south and 50 feet east of the NW. corner of sec. 30, T. 13 N., R. 24 E.

Ap—0 to 8 inches, light yellowish-brown (10YR 6/4) light loam, dark yellowish brown (10YR 4/4) when moist; weak, fine, granular structure; very friable when

Figure 7.—**Drainage ditches on Lela clay.**

moist, slightly hard when dry; slightly acid; clear, smooth boundary. 6 to 12 inches thick.

B1—8 to 12 inches, reddish-yellow (7.5YR 6/6) loam, strong brown (7.5YR 4/6) when moist; weak, fine, granular structure; friable when moist, hard when dry; medium acid; gradual, smooth boundary. 3 to 7 inches thick.

B21t—12 to 20 inches, reddish-yellow (5YR 6/6) light clay loam, yellowish red (5YR 4/6) when moist; weak, fine, subangular blocky structure; friable when moist, hard when dry; discontinuous clay films; strongly acid; gradual, smooth boundary. 6 to 15 inches thick.

B22t—20 to 26 inches, mottled brownish-yellow (10YR 6/6), light-gray (10YR 7/2), and red (2.5YR 4/8) light clay loam; weak, fine, subangular blocky structure; friable when moist, hard when dry; few patchy clay films; few soft sandstone fragments; very strongly acid; clear, irregular boundary. 4 to 10 inches thick.

R—26 to 30 inches +, sandstone.

The color of the Ap horizon ranges from very pale brown to pale brown or light yellowish brown. In virgin areas there is an A1 horizon, 2 to 5 inches thick, that ranges from light yellowish brown to grayish brown and an A2 horizon, 5 to 12 inches thick, that ranges from very pale brown to pale brown. The texture of the A horizon is light loam in most places, but it ranges to fine sandy loam. The color of the B21t horizon ranges from reddish yellow to brown or reddish brown. In a few areas it is light red to red. Reaction ranges from strongly acid to very strongly acid in the B2t horizon. The depth to sandstone ranges from 20 to 48 inches.

Linker soils have a thinner solum than Pickwick and Vian soils.

Linker-Hector complex, 2 to 5 percent slopes (LnC).—The soils in this complex are shallow to deep. They are less stony than the soils in Hector-Linker-Enders complex, 5 to 40 percent slopes. About 60 percent of the acreage consists of Linker loam, 15 percent of Hector fine sandy loam, and 20 percent of a soil similar to Linker loam. Included in the areas mapped are areas of Stigler silt loam and Pickwick loam, which make up about 5 percent of the acreage.

These soils can be farmed, but they are better suited to tame pasture or native grasses. Some of the crops commonly grown are small grain, sorghum, sericea lespedeza, soybeans, and garden crops.

Maintenance of structure and fertility are management problems. The natural fertility is moderate to low. The shallow soils are droughty. If these soils are cultivated, terracing and contour farming are needed to control water erosion. If tame pasture plants are grown, brush control and weed control are needed. Field crops and pasture plants respond well to fertilization and liming. (Capability unit IVe–1; woodland group 6; Sandy Savannah and Shallow Savannah range sites)

Linker-Hector complex, 5 to 8 percent slopes (LnD).—The soils in this complex are shallow to deep. They are less stony than the soils in Hector-Linker-Enders complex, 5 to 40 percent slopes. About 70 percent of the acreage consists of Linker loam and 15 percent of Hector fine sandy loam. Included in the areas mapped are areas of Pickwick loam, Enders fine sandy loam, and a soil similar to Linker loam, except that it has a brownish-yellow or yellow B2t horizon. The included areas make up about 15 percent of the acreage.

This complex is not suited to cultivated crops, because the soils are shallow in places and are sloping. It is suited to tame pasture and native grasses. Tame pasture plants respond well to proper fertilization and liming. Weed control and brush control are necessary on tame pasture. An adequate cover of vegetation is needed at all times to control erosion. (Capability unit VIe–1; woodland group 6; Sandy Savannah and Shallow Savannah range sites)

Linker and Stigler soils, 2 to 8 percent slopes, severely eroded (LoD3).—The soils in this undifferentiated group have a surface layer that is eroded and consequently is thinner than that in the profile described as typical of each series. The average composition is 45 percent Linker soils, 30 percent Stigler soils, 15 percent Pickwick soils, and 10 percent Vian, Spiro, and McKamie soils. Any given area may be dominantly Linker soils or dominantly Stigler soils, or both soils may occur with the other soils that were included in mapping.

In most places these soils are moderately to severely eroded. Rills have formed, and there are numerous gullies, 2 to 10 feet deep, 4 to 20 feet wide, and 100 to 300 feet apart. Sheet erosion between gullies ranges from slight to severe. In the less eroded spots, the surface layer ranges from silt loam to heavy fine sandy loam. In other areas, the surface layer has been mixed with the upper part of the subsoil, and the texture ranges from loam to light clay loam.

These soils are not suited to cultivated crops. They are suited to tame pasture and native grasses. Pasture plants respond well to fertilization and liming. A vegetative cover is needed to control further erosion. (Capability unit VIe–3; Loamy Savannah range site; the Linker soil is in woodland group 8)

Lonoke Series

The Lonoke series consists of deep, moderately permeable to moderately slowly permeable, well-drained soils on bottom lands. These soils occur in the southern part of the county along the Arkansas River. They are seldom flooded.

Soils of the Lonoke series typically have a surface layer of brown or reddish-brown loam or silty clay loam and a subsoil of light-brown loam. Below this is light-brown heavy very fine sandy loam.

These soils are important for general farming. A few small areas support mixed hardwood forest.

Representative profile of Lonoke loam, nearly level, 2,400 feet north and 450 feet east of the SW. corner of sec. 23, T. 10 N., R. 26 E.

A1—0 to 18 inches, brown (7.5YR 5/4) loam, dark brown (7.5YR 3/4) when moist; weak, fine, granular structure; friable when moist, hard when dry; medium acid; clear, smooth boundary. 10 to 20 inches thick.

B—18 to 24 inches, light-brown (7.5YR 6/4) loam, brown (7.5YR 4/4) when moist; weak, fine, granular structure; friable when moist; hard when dry; slightly acid; gradual, wavy boundary. 3 to 10 inches thick.

C1—24 to 50 inches, light-brown (7.5YR 6/4) heavy very fine sandy loam, brown (7.5YR 5/4) when moist; weak, fine, granular structure; friable when moist, hard when dry; slightly acid; clear, wavy boundary. 16 inches to several feet thick.

IIC2—50 to 70 inches +, very pale brown (10YR 7/4) fine sand, yellowish brown (10YR 5/4) when moist; single grain; loose when moist or dry; slightly acid.

The A horizon generally ranges from loam to silty clay loam in texture, but in places it is heavy very fine sandy loam. In color, it ranges from brown to dark brown in a hue of 7.5YR and from reddish brown to dark reddish gray in a hue of 5YR. It is medium acid to neutral. The B horizon ranges from silty clay loam to heavy very fine sandy loam in texture.

When moist, it ranges in color from brown to dark brown in a hue of 7.5YR and from reddish brown to dark reddish gray in a hue of 5YR. This horizon is slightly acid to neutral. The C1 horizon ranges from loam to light very fine sandy loam in texture and from light brown to brown in color. It is slightly acid to mildly alkaline. The IIC horizon does not occur in all profiles. Where this horizon is present, its color ranges from very pale brown to pale brown in a hue of 10YR and from pink to light brown in a hue of 7.5YR. It is slightly acid to mildly alkaline. Where this horizon is present, it occurs at a depth of more than 45 inches.

Lonoke soils are less sandy than Robinsonville and Yahola soils. They are not so clayey below the A horizon as Brewer and Mason soils.

Lonoke loam, nearly level (LrA).—This soil is deep and well drained. The slope ranges from 0 to 2 percent. Included in mapping were areas where the dark color of the surface layer extends to a depth of more than 20 inches. These areas make up about 30 percent of the acreage. Also included in mapping were small areas of Lonoke silty clay loam, level; small areas of Robinsonville fine sandy loam, level; and areas where the depth to fine sand is about 30 inches.

This soil is suitable for irrigation. It is well suited to alfalfa, corn, cotton, small grain, sorghum, soybeans, spinach, and tame pasture. The natural fertility is moderate to high. Tillage is easy.

The principal management problems are maintenance of structure and fertility. An example of a suitable cropping system is double cropping small grain with soybeans year after year. Adequate amounts of fertilizer should be applied, and the crop residue should be used for maintenance of structure and fertility and as a source of organic matter. Crops respond well to fertilization. (Capability unit I-1; woodland group 3)

Lonoke silty clay loam, level (LsA).—This soil has a surface layer that ranges from 6 to 20 inches in thickness. The slope ranges from 0 to 1 percent. Included in mapping were areas where the dark color of the surface layer extends to a depth of more than 20 inches. These areas make up about 30 percent of the acreage. Also included in mapping were small areas of Lonoke loam, nearly level; small areas where the surface layer is more than 20 inches thick; and small areas where the depth to fine sand is about 35 inches.

This soil is suitable for irrigation. It is well suited to alfalfa, corn, cotton, small grain, sorghum, soybeans, spinach, and tame pasture. The natural fertility is moderate to high. Tillage is easy.

The principal management problems are maintenance of structure and fertility. An example of a suitable cropping system is double cropping small grain with soybeans year after year. Adequate amounts of fertilizer should be applied, and the crop residue should be used for maintenance of structure and fertility and as a source of organic matter. Crops respond well to fertilization. (Capability unit I-1; woodland group 3)

Lonoke silty clay loam, undulating (LsB).—This soil occurs on short, irregular slopes. It has a surface layer that ranges from 6 to 20 inches in thickness. The slope ranges from 1 to 3 percent. Included in mapping were areas where the dark color of the surface layer extends to a depth of more than 20 inches. These areas make up about 25 percent of the acreage. Also included in mapping were small areas of Latanier clay, areas where the surface layer is more than 20 inches thick, and small areas where the depth to fine sand is only about 35 inches.

This soil is suited to such close-growing crops as alfalfa, small grain, and sown sorghum. A mixture of bermudagrass and legumes or tall fescue and legumes makes a good pasture.

The principal management problems are maintenance of structure and fertility and control of water erosion. Spinach, cotton, corn, and soybeans should be grown in a cropping system with other crops that produce enough residue for control of water erosion and maintenance of structure, fertility, and tilth. The irregular slopes make terracing impractical. Crops respond well to fertilization. Lime is seldom needed. (Capability unit IIe-5; woodland group 3)

Mason Series

The Mason series consists of deep, moderately permeable, well-drained soils on bottom lands. These soils occur mainly in the central and western parts of the county along most of the major streams other than the Arkansas River. They are seldom flooded.

Soils of the Mason series typically have a surface layer of brown silt loam and a subsoil of brown silty clay loam.

These soils are extensive. Most of the acreage is used for general farming, tame pasture, and meadow. A few areas support mixed hardwood forest.

Representative profile of Mason silt loam, 450 feet north and 200 feet west of the SE. corner of SW¼ sec. 34, T. 12 N., R. 23 E.

A1—0 to 11 inches, brown (10YR 5/3) silt loam, dark brown (10YR 3/3) when moist; weak, medium, granular structure; friable when moist, hard when dry; few, fine, faint, yellowish-brown mottles; slightly acid; gradual, smooth boundary. 7 to 14 inches thick.

B21t—11 to 28 inches, brown (7.5YR 5/4) silty clay loam, dark brown (7.5YR 3/4) when moist; weak, medium, subangular blocky structure; firm when moist, hard when dry; few, fine, faint, yellowish-red mottles; few clay films; medium acid; diffuse, smooth boundary. 12 to 24 inches thick.

B22t—28 to 80 inches +, brown (7.5YR 5/4) silty clay loam, dark brown (7.5YR 4/4) when moist; weak, medium, subangular blocky structure; firm when moist, hard when dry; few, fine, faint, yellowish-red mottles; distinct, discontinuous clay films; medium acid.

The A1 horizon ranges from brown to dark grayish brown in color. The texture of this horizon is silt loam in most places but ranges to loam. The B2t horizon ranges from yellowish brown to brown in color and from clay loam to silty clay loam in texture. The reaction is slightly acid to medium acid.

Mason soils are not so gray as Brewer soils, and they are less clayey in the lower part of the B2t horizon than those soils. They have a more strongly developed B horizon than Lonoke soils and are less sandy throughout than Razort soils.

Mason silt loam (0 to 2 percent slopes) (Ma).—This soil is deep and well drained. Included in mapping were small areas of Cleora fine sandy loam, Rosebloom silt loam, and Razort fine sandy loam.

This soil is suitable for irrigation. It is well suited to alfalfa, corn, cotton, small grain, soybeans, and tame pasture. The natural fertility is moderate to high. Tillage is easy.

The principal management problems are maintenance of structure and fertility. An example of a suitable cropping system is double cropping small grain with soybeans. Adequate amounts of fertilizer should be applied, and

the crop residue should be used for maintenance of structure and fertility. Crops respond well to fertilization. (Capability unit I–1; woodland group 3)

McKamie Series

The McKamie series consists of deep, slowly permeable, well-drained soils on uplands. These soils occur on breaks adjacent to bottom lands along the Arkansas River. They formed in old clayey alluvium.

Soils of the McKamie series typically have a surface layer of loam that is light brownish gray in the upper part and very pale brown in the lower part. The subsoil is red clay. The upper part is strongly acid; the lower part is calcareous.

These soils are not extensive. They are used for woodland range or tame pasture.

Representative profile of McKamie loam, 400 feet east and 20 feet south of the NW. corner of SW¼ sec. 35, T. 11 N., R. 23 E.

A1—0 to 2 inches, light brownish-gray (10YR 6/2) loam, dark grayish brown (10YR 4/2) when moist; weak, fine, granular structure; very friable when moist, slightly hard when dry; medium acid; clear, wavy boundary. 1 to 4 inches thick.

A2—2 to 7 inches, very pale brown (10YR 7/3) loam, brown (10YR 5/3) when moist; massive; very friable when moist, slightly hard when dry; few, faint, yellowish-brown and brownish-gray mottles; very strongly acid; clear, wavy boundary. 2 to 8 inches thick.

B21t—7 to 30 inches, red (2.5YR 4/6) clay, dark-red (2.5YR 3/6) when moist; moderate, fine and very fine, subangular blocky structure; firm when moist, very hard when dry; calcareous; clear, wavy boundary, 15 to terial from the A2 horizon on vertical faces of peds; strongly acid; diffuse, smooth boundary. 6 to 36 inches thick.

B22t—30 to 70 inches +, red (2.5 4/6) clay, dark-red (2.5YR 3/6) when moist; weak, fine, subangular blocky structure; very firm when moist, extremely hard when dry; numerous clay films; few very pale brown mottles; calcareous; calcium carbonate concretions are common in the upper part and become more numerous with depth.

The A1 horizon ranges from light brownish gray to dark grayish brown. The A2 horizon is very pale brown to pale brown. In most cultivated areas there is a brown Ap horizon. In most places the texture of the A horizon is loam, but it ranges to very fine sandy loam. The B2t horizon ranges from red to yellowish red in color. In some profiles pale-brown mottles are common in the upper part of the B21t horizon. Calcareous material is 6 to 45 inches below the upper boundary of the argillic horizon.

McKamie soils have a thinner surface layer than Stigler soils. Their subsoil is more reddish and less mottled than that of those soils, and it is less acid in the lower part. These soils are better drained and less grayish than Wrightsville soils, and the lower part of their subsoil is less acid than that of those soils.

McKamie loam, 5 to 12 percent slopes (MkE).—This soil is deep and slowly permeable. In a few places the subsoil is calcareous throughout. Most areas contain numerous natural drainageways. Included in the areas mapped are small areas of a similar soil that has light-gray mottles in the uppermost 20 inches of the subsoil, small areas of McKamie loam that has 4 percent slopes, and small areas of Pickwick loam.

This soil is not suited to cultivated crops, because of the slope and the many drainageways. It is suited to tame pasture and native grasses. Some areas are wooded and are used for woodland range. The natural fertility is moderate to low. Surface runoff is rapid, and a cover of permanent vegetation is needed for control of water erosion. Tame pasture plants respond well to fertilization and liming. (Capability unit VIe–2; Loamy Savannah range site)

Miller Series

The Miller series consists of deep, very slowly permeable, somewhat poorly drained to moderately well drained soils on bottom lands. These soils occur in the southeastern part of the county along the Arkansas River. They are seldom flooded.

Soils of the Miller series typically have a surface layer of dark reddish-gray, mildly alkaline clay overlying a layer of reddish-brown, calcareous clay. The substratum is reddish-brown very fine sandy loam over pink fine sand.

These soils are not extensive. Most of the acreage is used for general farming. A few areas support mixed hardwood forest.

Representative profile of Miller clay, 600 feet east and 50 feet north of the SW. corner of sec. 10, T. 11 N., R. 27 E.

A1—0 to 10 inches, dark reddish-gray (5YR 4/2) clay, dark reddish brown (5YR 3/2) when moist; moderate, medium and fine, subangular blocky structure; very firm when moist, very hard when dry; mildly alkaline; clear, smooth boundary. 6 to 12 inches thick.

AC1—10 to 22 inches, reddish-brown (5YR 4/3) clay, dark reddish brown (5YR 3/3) when moist; moderate, fine, blocky structure; very firm when moist, very hard when dry; calcareous; gradual, smooth boundary. 8 to 22 inches thick.

AC2—22 to 50 inches, reddish-brown (5YR 4/3) clay, dark reddish brown (5YR 3/3) when moist; weak, medium, blocky structure; very firm when moist, very hard when dry; calcareous; clear, wavy boundary. 15 to 45 inches thick.

IIC1—50 to 58 inches, reddish-brown (5YR 5/4) very fine sandy loam, reddish brown (5YR 4/4) when moist; massive; friable when moist, hard when dry; calcareous; clear, wavy boundary. 5 inches to several feet thick.

IIIC2—58 to 70 inches +, pink (7.5YR 7/4) fine sand, brown (7.5YR 5/4) when moist; single grain; loose; mildly alkaline.

The A1 horizon ranges from brown to dark reddish gray in color and from clay to silty clay loam in texture. It is neutral to mildly alkaline. The AC2 horizon is reddish brown in a hue ranging from 2.5YR to 5YR. The depth to the more sandy substratum ranges from 40 to 60 inches. The substratum is fine sand in most places, but the texture ranges to very fine sandy loam. In some profiles it has strata of silty clay loam or clay. Reaction in the substratum ranges from neutral to moderately alkaline.

Miller soils are more clayey than Lonoke soils, and they have a thicker layer of clay than Latanier soils. They are redder and more alkaline than Lela soils.

Miller clay (0 to 1 percent slopes) (Mr).—This soil has the profile described as typical of the Miller series. Included in the areas mapped are small areas of Latanier clay, Miller silty clay loam, and Lonoke silty clay loam, level.

This soil is suited to soybeans and small grain. It is also suited to tall fescue and other tame pasture plants and to pecans. A small acreage is used for corn, spinach, and alfalfa. The natural fertility is moderately high.

Management problems in use of this soil are maintaining structure and fertility and draining excess surface water. Wetness causes difficulty in establishing uniform stands of crops. The clayey texture and the narrow range of moisture content within which the soil can be worked

are limitations in tillage and harvesting. An example of a suitable cropping system is double cropping small grain with soybeans. Adequate amounts of fertilizer should be applied, and the crop residue should be used for maintenance of structure, tilth, and fertility. Crops respond well to fertilization. Surface drainage is usually needed. (Capability unit IIIw–1; woodland group 1)

Miller silty clay loam (0 to 1 percent slopes) (Ms).—The surface layer of this soil ranges from 8 to 17 inches in thickness. It is underlain by clay. Included in the areas mapped are small areas of Latanier clay, Miller clay, and Lonoke silty clay loam, level, as well as small areas where the depth to the sandy substrata is only 30 to 40 inches.

This soil is suited to soybeans, small grain, and pecans. It is also suited to alfalfa, corn, cotton, sorghum, spinach, and tame pasture. The natural fertility is moderately high.

The principal management problem in the use of this soil for crops is draining excess surface water. Wetness causes difficulty in establishing uniform stands and interferes with tillage and harvesting. An example of a suitable cropping system is double cropping small grain with soybeans. Adequate amounts of fertilizer should be applied, and the crop residue should be used for maintenance of structure, tilth, and fertility. Crops respond well to fertilization. Surface drainage is usually needed. (Capability unit IIIw–1; woodland group 1)

Muldrow Series

The Muldrow series consists of deep, very slowly permeable, somewhat poorly drained soils on bottom lands. These soils occur along the Arkansas River. They are seldom flooded.

Soils of the Muldrow series typically have a surface layer of grayish-brown silty clay loam. The upper part of the subsoil is dark-gray light silty clay, and the lower part is grayish-brown silty clay.

These soils are not extensive, but they are important for general farming. A few small areas support mixed hardwood forest.

Representative profile of Muldrow silty clay loam, 600 feet west and 200 feet north of the SE. corner of sec. 20, T. 11 N., R. 27 E.

A1—0 to 23 inches, grayish-brown (10YR 5/2) silty clay loam, very dark grayish brown (10YR 3/2) when moist; moderate, fine, subangular blocky structure; firm when moist, hard when dry; slightly acid; diffuse, smooth boundary. 15 to 30 inches thick.

B21tg—23 to 50 inches, dark-gray (10YR 4/1) light silty clay, very dark gray (10YR 3/1) when moist; moderate, fine, blocky structure; firm when moist, very hard when dry; discontinuous clay films; common, distinct, yellowish-brown and strong-brown mottles; neutral; diffuse, smooth boundary. 25 to 36 inches thick.

B22tg—50 to 70 inches +, grayish-brown (10YR 5/2) silty clay, very dark grayish brown (10YR 3/2) when moist; weak, fine, blocky structure; very firm when moist, very hard when dry; numerous clay films; common, distinct, gray, yellowish-brown, and strong-brown mottles; few, small, black and yellowish-brown concretions; neutral.

The A1 horizon ranges from silty clay loam to heavy silty clay loam in texture and from grayish brown to dark gray in color. The B21tg horizon ranges from heavy silty clay loam to light silty clay and from light brownish gray to dark gray. It is slightly acid to neutral. Mottles range from common to many and from yellowish brown to strong brown and reddish brown. The B22tg horizon ranges from light silty clay to silty clay and from grayish brown to dark gray. In a few places this horizon is brown below a depth of 60 inches. Mottles range from common to many in a color range of yellowish brown, strong brown, reddish brown, and gray. This horizon is slightly acid to moderately alkaline.

Muldrow soils are not so well drained as Brewer soils, and mottling occurs higher in the profile than in those soils. Their surface layer is not so clayey as that of Lela soils.

Muldrow silty clay loam (0 to 1 percent slopes) (Mu).—The areas mapped as this soil include small areas of Brewer silt loam and Lela clay.

This soil is suited to alfalfa, corn, cotton, small grain, sorghum, soybeans, spinach, and tame pasture. The natural fertility is moderately high to high.

The principal management problem in the use of this soil for crops is draining excess surface water. Wetness in spring and fall interferes with tillage and harvesting. Other problems are maintenance of structure and fertility. An example of a suitable cropping system is double cropping small grain with soybeans year after year. The use of crop residue and minimum and timely tillage reduces the probability of soil compaction, increases the rate of water intake, and helps to maintain structure and fertility. Field crops and tame pasture plants respond well to fertilization. Surface drainage is beneficial in a few places. (Capability unit IIw–1; woodland group 1)

Pickwick Series

The Pickwick series consists of deep, moderately permeable, well-drained soils on uplands. These soils occur throughout the county. They formed in material weathered from sandstone.

Soils of the Pickwick series typically have a surface layer of loam that is light brownish gray in the upper part and very pale brown in the lower part. The subsoil is reddish-yellow clay loam that is mottled in the lower part. Sandstone is at a depth of about 68 inches.

These soils are important for general farming. Some areas support mixed stands of hardwoods or pine.

Representative profile of Pickwick loam, 700 feet south and 600 feet west of the NE. corner of sec. 9, T. 12 N., R. 23 E.

A1—0 to 4 inches, light brownish-gray (10YR 6/2) light loam, dark grayish brown (10YR 4/2) when moist; weak, fine, granular structure; friable when moist, hard when dry; few, small, yellowish-brown concretions; few sandstone pebbles; medium acid; clear, smooth boundary. 5 to 10 inches thick.

A2—4 to 10 inches, very pale brown (10YR 7/4) light loam, yellowish brown (10YR 5/4) when moist; weak, fine, granular structure; friable when moist, hard when dry; few sandstone pebbles; strongly acid; clear, smooth boundary. 5 to 10 inches thick.

B1—10 to 14 inches, reddish-yellow (7.5YR 6/6) light clay loam, strong brown (7.5YR 5/6) when moist; weak, fine, subangular blocky structure; friable when moist, hard when dry; few small sandstone pebbles; few, small, black concretions; very strongly acid; gradual, smooth boundary. 3 to 7 inches thick.

B21t—14 to 28 inches, reddish-yellow (5YR 6/8) clay loam, yellowish red (5YR 5/8) when moist; moderate, fine and medium, subangular blocky structure; friable when moist, hard when dry; discontinuous clay films; few sandstone pebbles; few, black, soft concretions; common, distinct, red and very pale brown mottles below a depth of 21 inches; very strongly acid; gradual, smooth boundary. 8 to 20 inches thick.

B22t—28 to 43 inches, coarsely mottled, reddish-yellow (5YR 6/8 and 7.5YR 6/8) clay loam; moderate, coarse, subangular blocky structure; firm when moist, hard when dry; common, fine, distinct mottles of red, very pale brown, and light gray; discontinuous clay films; few sandstone pebbles; very strongly acid; diffuse, smooth boundary. 10 to 20 inches thick.

B3—43 to 68 inches, mottled light-gray (10YR 7/1) and reddish-yellow (7.5YR 6/8) clay loam; weak, medium, subangular blocky structure; firm when moist, hard when dry; few red mottles; few clay films; few yellowish-brown and black concretions; few sandstone pebbles; very strongly acid; clear, irregular boundary. 14 to 36 inches thick.

R—68 to 74 inches +, acid sandstone.

In most places the texture of the A horizon is loam, but it ranges to heavy fine sandy loam. The color of the A1 horizon ranges from pale brown to grayish brown, and that of the A2 horizon, from very pale brown to pale brown. In cultivated areas there is a light yellowish-brown to brown Ap horizon. The texture of the B1 horizon is loam, heavy loam, or light clay loam. The color ranges from reddish yellow to strong brown. The color of the B21t horizon ranges from reddish yellow to reddish brown or brown. The B2t and B3 horizons are strongly acid to very strongly acid. The depth to bedrock ranges from 48 to 84 inches.

Pickwick soils are less silty than Vian soils and are more reddish in the subsoil than those soils. They are deeper over bedrock than Linker soils. They lack the gravelly layer that is typical of Sallisaw soils.

Pickwick loam, 1 to 3 percent slopes (PcB).—This soil is well drained. It is deeper over bedrock than more strongly sloping Pickwick soils. In about 30 percent of the acreage, the subsoil is brownish yellow. Included in the areas mapped are small areas of Linker loam and Stigler silt loam, 1 to 3 percent slopes. Also included are small, moderately eroded areas.

This soil is suited to small grain, sorghum, soybeans, tame pasture, and pecans. Only a few areas are presently cultivated. The natural fertility is moderately low to low. The organic-matter content is low.

The principal management problems are maintaining structure and fertility and controlling water erosion. An example of a suitable cropping system is soybeans rotated with sericea lespedeza. The residue should be used for maintenance of structure, fertility, and tilth. Terracing, contour farming, and a good cropping system are needed for control of erosion if row crops are grown. Fertilization and liming are beneficial. (Capability unit IIe-4; woodland group 7)

Pickwick loam, 3 to 5 percent slopes (PcC).—This soil is well drained. It has the profile described as typical of the Pickwick series, except in about 20 percent of the acreage, where the subsoil is brownish yellow. Included in the areas mapped are small areas of Linker loam and small areas that are moderately eroded.

This soil is suited to small grain, sorghum, soybeans, and tame pasture. The natural fertility is low to moderately low. The organic-matter content is low.

The principal management problems are controlling water erosion and maintaining structure and fertility. An example of a suitable cropping system is growing grain sorghum for 2 years then soybeans for 2 years. The residue should be used for soil maintenance. If large amounts of nonleguminous crop residue are returned to the soil, nitrogen is needed to hasten decomposition. Terracing and contour farming are needed for control of erosion if cultivated crops are grown. Brush control and weed control are needed if tame pasture plants are grown. Fertilization and liming are beneficial. (Capability unit IIIe-3; woodland group 7)

Pickwick loam, 2 to 5 percent slopes, eroded (PcC2).—Erosion has thinned the surface layer of this soil and created rills and a few gullies. The thickness of the surface layer varies considerably within short distances. In about 70 percent of the acreage, the surface layer is 7 to 11 inches thick, and in about 30 percent it is 1 to 6 inches thick and generally contains some clay loam from the subsoil. Generally the surface layer is thinnest near rills and gullies. The subsoil is brownish yellow in about 30 percent of the acreage. Included in the areas mapped are small areas of Linker loam.

This soil is suited to such close-growing crops as small grain, sown sorghum, and tame pasture. A mixture of bermudagrass and legumes makes a good pasture. The natural fertility is low, and the organic-matter content is low.

The principal management problems are controlling water erosion and preventing further deterioration of structure and fertility. Terracing and contour farming are needed for control of erosion if cultivated row crops are grown. Control of brush and of weeds is needed to maintain good stands of tame pasture. Fertilization and liming benefit both cultivated crops and tame pasture. (Capability unit IIIe-5; woodland group 8)

Razort Series

The Razort series consists of deep, moderately permeable, well-drained soils on bottom lands. These soils occur mainly in the northeastern part of the county along Little Lee Creek and Lee Creek. They are seldom flooded.

Soils of the Razort series typically have a surface layer of brown fine sandy loam and a subsoil of brown sandy clay loam.

These soils are important for farming. Most areas are used for tame pasture or cultivated crops. A small acreage supports mixed hardwood forest.

Representative profile of Razort fine sandy loam, 2,100 feet north and 400 feet west of the SE. corner of SW¼ sec. 28, T. 13 N., R. 26 E.

A1—0 to 11 inches, brown (10YR 5/3) fine sandy loam, dark brown (10YR 3/3) when moist; weak, fine, granular structure; very friable when moist, hard when dry; medium acid; gradual, smooth boundary. 8 to 16 inches thick.

B21t—11 to 40 inches, brown (7.5YR 5/4) sandy clay loam, dark brown (7.5YR 3/4) when moist; weak, medium, subangular blocky structure; friable when moist, hard when dry; few small pebbles in lower part; discontinuous clay films; medium acid; gradual, smooth boundary. 20 to 40 inches thick.

B22t—40 to 70 inches +, brown (7.5YR 5/4) sandy clay loam, dark brown (7.5YR 3/4) when moist; weak, coarse, subangular blocky structure; friable when moist, hard when dry; small pebbles make up less than 5 percent of the horizon; medium acid.

The texture of the A1 horizon is fine sandy loam in most places, but it ranges to light loam. The color is brown in most places. The texture of the B2t horizon is light sandy clay loam, sandy clay loam, light clay loam, or clay loam that is less than 35 percent clay. This horizon is medium acid to slightly acid.

Razort soils are more sandy throughout the profile than Mason and Brewer soils. They are more strongly developed than Lonoke, Robinsonville, and Cleora soils.

Razort fine sandy loam (0 to 2 percent slopes) (Ra).—This soil is deep and well drained. Included in mapping were small areas of Cleora fine sandy loam and of Mason silt loam, areas of a soil that is strongly acid in the lower part of the subsoil, and small areas where the slope is 4 percent.

This soil is suitable for irrigation. It is used mostly for tame pasture. A few areas are used for corn, soybeans, small grain, and grain sorghum. The natural fertility is moderate to high. Tillage is easy.

The principal management problems are maintenance of structure and fertility. An example of a suitable cropping system is double cropping small grain with soybeans year after year. Adequate amounts of fertilizer should be applied, and the crop residue should be used for maintenance of structure and fertility and as a source of organic matter. Cultivated crops and tame pasture plants respond well to fertilization. (Capability unit I–1; woodland group 3)

Robinsonville Series

This series consists of deep, moderately rapidly permeable, well-drained soils on bottom lands. These soils occur along the Arkansas River in areas above common overflow.

Soils of the Robinsonville series typically have a surface layer of light-brown fine sandy loam and a subsoil of light reddish-brown fine sandy loam. Below this is pink loamy fine sand.

These soils are not extensive but are important for general farming. Small areas support mixed hardwood forest.

Representative profile of Robinsonville fine sandy loam, 350 feet south and 175 feet west of the NE. corner of sec. 20, T. 10 N., R. 26 E.

Ap—0 to 9 inches, light-brown (7.5YR 6/4) fine sandy loam, brown (7.5YR 4/4) when moist; weak, fine, granular structure; very friable when moist, slightly hard when dry; medium acid; clear, smooth boundary. 7 to 13 inches thick.

AC—9 to 50 inches, light reddish-brown (5YR 6/4) fine sandy loam, reddish brown (5YR 5/4) when moist; weak, fine, granular structure; very friable when moist, slightly hard when dry; medium acid; clear, wavy boundary. 30 to 50 inches thick.

IIC—50 to 70 inches +, pink (7.5YR 7/4) loamy fine sand, brown (7.5YR 5/4) when moist; massive; very friable when moist, slightly hard when dry; medium acid.

The Ap horizon is light brown to brown. The texture of the Ap and AC horizons is dominantly fine sandy loam but ranges to light very fine sandy loam. The color of the AC horizon ranges from pink to reddish brown. The depth to the IIC horizon ranges from 40 to 55 inches. The reaction throughout the profile is medium acid to neutral.

Robinsonville soils are more acid than Yahola soils. They are not so sandy as Crevasse soils. Their surface layer is lighter colored than that of Cleora soils, and their substrata are more sandy.

Robinsonville fine sandy loam, level (RoA).—This soil is deep and well drained. It has the profile described as typical of the Robinsonville series. The slope ranges from 0 to 1 percent. Included in the areas mapped are small areas of Yahola fine sandy loam and of Lonoke loam, nearly level.

This soil is suited to small grain, soybeans, spinach, and watermelons. It is suitable for irrigation. The natural fertility is moderate. Tillage is easy.

The principal management problems are maintenance of structure and fertility. Growing alfalfa for 3 to 5 years, then spinach, is an example of a suitable cropping system. If large amounts of nonleguminous residue are used, nitrogen is needed to hasten decomposition. Crops respond well to fertilization. (Capability unit I–2; woodland group 2)

Robinsonville fine sandy loam, undulating (RoB).—This soil is deep and well drained. It occurs on short, irregular slopes. The slope ranges from 1 to 3 percent. Included in the areas mapped are small areas of Yahola fine sandy loam and of Lonoke loam, nearly level. Also included are areas where the depth to loamy fine sand is only 30 inches and small areas that are nearly level.

This soil is suited to spinach, small grain, soybeans, and watermelons. The natural fertility is moderately high.

The principal management problems are controlling erosion and maintaining structure and fertility. An example of a suitable cropping system is double cropping small grain with soybeans year after year. The crop residue should be returned to the soil as a source of organic matter. If large amounts of nonleguminous residue are used, nitrogen is needed to hasten decomposition. Terracing and contour tillage are not feasible, because of the irregular slope. The undulating relief is a limitation if the soil is irrigated. Crops respond well to fertilization. (Capability unit IIe–3; woodland group 2)

Rosebloom Series

The Rosebloom series consists of deep, very slowly permeable, poorly drained soils on bottom lands. These soils occur along most of the larger streams in the county other than the Arkansas River. They are frequently to occasionally flooded.

Soils of the Rosebloom series typically have a surface layer of light brownish-gray silt loam. Their subsoil consists of an upper layer of gray light silty clay loam and a lower layer of gray silty clay loam. Mottles occur throughout the profile.

These soils are used mainly for pasture or meadow. Some areas support hardwood forest. A small acreage is used for soybeans and small grain.

Representative profile of Rosebloom silt loam, 1,400 feet west and 300 feet north of the SE. corner of NE¼ sec. 9, T. 11 N., R. 24 E.

A1—0 to 10 inches, light brownish-gray (10YR 6/2) silt loam, dark grayish brown (10YR 4/2) when moist; weak, fine, granular structure; friable when moist, hard when dry; common, faint, light-gray mottles; few, fine, distinct, yellowish-brown mottles; few, small, yellowish-brown concretions; very strongly acid; gradual, smooth boundary. 7 to 13 inches thick.

B1—10 to 18 inches, gray (10YR 6/1) light silty clay loam, gray (10YR 5/1) when moist; weak, very fine, subangular blocky structure; friable when moist, hard when dry; few, fine, distinct, yellowish-brown mottles; few small yellowish-brown concretions; very strongly acid; gradual, smooth boundary. 6 to 12 inches thick.

B21—18 to 27 inches, gray (10YR 6/1) silty clay loam, gray (10YR 5/1) when moist; weak, very fine, subangular blocky structure; firm when moist, very hard when dry; common, faint, light-gray mottles; few, fine, distinct, yellowish-brown and brown mottles; many, small, yellowish-brown and black concretions; few patchy clay films; few vertical tongues of silt loam 1 to 3 inches wide; very strongly acid; gradual, smooth boundary. 7 to 18 inches thick.

B22—27 to 60 inches +, gray (10YR 6/1) silty clay loam, dark gray (10YR 4/1) when moist; weak, very fine, subangular blocky structure; firm when moist, extremely hard when dry; common, faint, light-gray mottles; few, fine, distinct, yellowish-brown mottles; numerous, small, yellowish-brown and black concretions; few patchy clay films; few vertical tongues of silt loam, 1 to 3 inches wide; strongly acid.

The color throughout the profile ranges from light gray to gray through light brownish gray. The texture of the B1 horizon ranges from heavy silt loam to light silty clay loam. The B2 horizon is strongly acid to very strongly acid.

Rosebloom soils are grayer and more poorly drained than Ennis and Mason soils.

Rosebloom silt loam, occasionally flooded (0 to 1 percent slopes) (Rs).—This soil is seasonally wet for extended periods because it is nearly level and poorly drained. At times, it is ponded in places. Included in the areas mapped are small areas of Ennis silt loam and small areas of a soil similar to Ennis silt loam, but somewhat poorly drained.

This soil is not well suited to cultivated crops, but it is occasionally used for soybeans and small grain. It is better suited to such pasture plants as bermudagrass, fescue, and clover. If cultivated crops are grown, the residue should be returned to the soil to maintain structure and fertility. A mixture of tall fescue and clover makes a good pasture if the soil is fertilized and limed according to plant needs. Surface drainage is beneficial. (Capability unit IIIw-3; woodland group 4)

Rosebloom silt loam, frequently flooded (0 to 1 percent slopes) (Rt).—In most years this soil is flooded two to four times a year, usually in spring. Included in the areas mapped are areas of soils that are similar to Rosebloom silt loam but have an overwash of loam or fine sandy loam. Also included are areas of somewhat poorly drained soils that are similar to Ennis soils. The included areas make up about a third of the acreage.

This soil is suited to tame pasture, meadow, or woodland. It is not suited to cultivated crops, because of frequent flooding. Fertilization and liming are beneficial to tame pasture and meadow plants. (Capability unit Vw-1; woodland group 4)

Rosebloom and Ennis soils, broken (0 to 15 percent slopes) (Ru).—The soils in this undifferentiated group are deep and poorly drained to well drained. The average composition is 30 percent Rosebloom soils, 30 percent Ennis soils, and 40 percent included soils. Any given area may be dominantly Rosebloom soils or dominantly Ennis soils, or both soils may occur with the other soils that were included in mapping. About 25 percent of most areas consists of a soil that is similar to the Ennis soils but is somewhat poorly drained. Other inclusions consist of fine sandy loams, soils that are medium acid, and soils that are similar to Ennis soils but have a darker surface layer.

Rosebloom and Ennis soils, broken, commonly occurs as areas 200 to 400 feet wide and as much as a mile long. The areas are strongly dissected by stream channels and are frequently flooded. The more strongly sloping areas are along stream channels.

These soils are not suited to cultivated crops, because of the hazard of flooding and the presence of stream channels. They are suited to tame pasture, meadow, and trees. Fertilization and liming are beneficial to pasture and meadow plants. (Capability unit Vw-1; woodland group 4)

Sallisaw Series

The Sallisaw series consists of deep, moderately permeable, well-drained soils on uplands. These soils occur along most of the major streams in the county. They formed in loamy old alluvium.

Soils of the Sallisaw series typically have a surface layer of light-brown loam. The upper part of the subsoil is light reddish-brown loam, and the lower part is reddish-yellow light clay loam. Gravelly light clay loam begins below a depth of 36 inches.

Some areas of these soils are cultivated. Most of the acreage was formerly used for general farming but has been allowed to revert to pasture. Small areas support mixed hardwood forest.

Representative profile of Sallisaw loam, 2,300 feet south and 1,450 feet east of the NW. corner of sec. 28, T. 13 N., R. 21 E.

A1—0 to 12 inches, light-brown (7.5YR 6/4) loam, brown (7.5YR 4/4) when moist; weak, fine, granular structure; very friable when moist, slightly hard when dry; few small chert pebbles; medium acid; gradual, smooth boundary. 7 to 13 inches thick.

B1—12 to 17 inches, light reddish-brown (5YR 6/4) loam, reddish brown (5YR 4/4) when moist; weak, fine, granular structure; friable when moist, hard when dry; few small pebbles; medium acid; gradual, smooth boundary. 5 to 8 inches thick.

B2t—17 to 36 inches, reddish-yellow (5YR 6/6) light clay loam, yellowish red (5YR 4/6) when moist; weak, fine, subangular blocky structure; friable when moist, hard when dry; few small pebbles; discontinuous clay films on ped faces and in pores; very strongly acid; clear, wavy boundary. 15 to 25 inches thick.

IIB3—36 to 70 inches +, 75 percent gravel and 25 percent reddish-yellow (5YR 6/6) gravelly light clay loam, yellowish red (5YR 4/6) when moist; weak, fine, subangular blocky structure; few, soft, black concretions; black coatings on some pebbles; very strongly acid.

In most places the texture of the A1 horizon is loam, but it ranges to heavy fine sandy loam. The color of this horizon ranges from light brown or light yellowish brown to brown. The texture of the B1 horizon ranges from loam to light clay loam, and the color from reddish yellow to reddish brown or brown. In places the texture of the B2t horizon is heavy silt loam, heavy loam, silty clay loam, or clay loam; the clay content is 22 to 35 percent. The color ranges from reddish yellow to reddish brown. The B2t horizon is medium acid to very strongly acid. The depth to the IIB3 horizon ranges from 30 to 60 inches.

Sallisaw soils are gravelly in the lower part of the subsoil, unlike soils of the Linker, Pickwick, and Vian series. They have a thinner surface layer than Vian soils and a more reddish subsoil.

Sallisaw loam, 1 to 3 percent slopes (SlB).—This soil has the profile (fig. 8) described as typical of the Sallisaw series. Included in the areas mapped are small areas where the depth to gravelly clay loam is less than 30 inches or more than 60 inches. Also included are small areas where the slope is 3 to 5 percent.

This soil is well suited to corn, cotton, small grain, sorghum, soybeans, and tame pasture. It is also suited to pecans.

The principal management problems are maintaining structure and fertility and controlling water erosion. An example of a suitable cropping system is soybeans followed by sericea lespedeza. Terracing, contour farming, and proper use of crop residue help to control erosion and to maintain structure and fertility. Crops respond well to

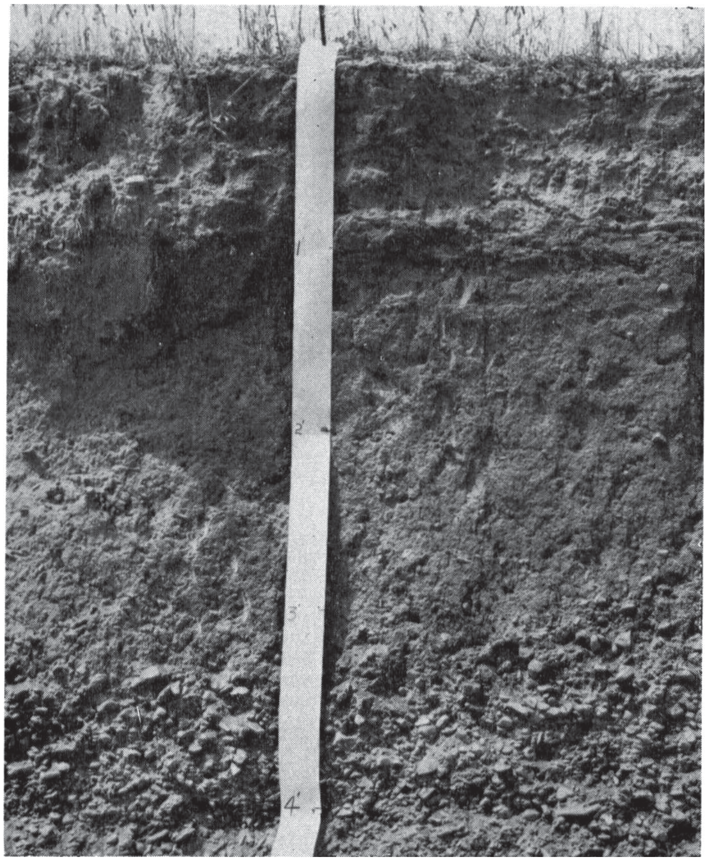


Figure 8.—**Profile of Sallisaw loam, 1 to 3 percent slopes.**

fertilization and liming. (Capability unit IIe-4; woodland group 7; Smooth Chert Savannah range site)

Sallisaw loam, 3 to 5 percent slopes (SlC).—The profile of this soil is similar to the one described as typical of the series but is shallower over gravel. Included in mapping were small areas of Sallisaw loam, 2 to 5 percent slopes, eroded, and small areas where the underlying gravel is at a depth of less than 30 inches or more than 60 inches.

This soil is suited to small grain, sorghum, soybeans, tame pasture, and sericea lespedeza for hay.

The principal management problems are controlling water erosion and maintaining structure and fertility. An example of a suitable cropping system is grain sorghum followed by soybeans. The crop residue should be returned to the soil to help control erosion and maintain structure and fertility. If cultivated crops are grown, terracing and contour farming are needed. If tame pasture is grown, brush control and weed control are needed. Fertilizer and lime should be applied to insure enough residue for erosion control. Nitrogen fertilizer is needed to hasten decomposition if large amounts of residue are mixed into the surface layer. (Capability unit IIIe-3; woodland group 7; Smooth Chert Savannah range site)

Sallisaw loam, 2 to 5 percent slopes, eroded (SlC2).—The profile of this soil has a thinner surface layer than the one described as representative of the series but is otherwise similar. In about 65 percent of the area, the surface layer is 6 to 11 inches thick. In about 35 percent, it is 2 to 6 inches thick. The thinner areas are generally near rills and gullies, and in most places light clay loam from the subsoil is mixed with the surface layer.

This soil is suited to small grain, sorghum, and tame pasture. A mixture of bermudagrass and legumes makes a good pasture.

The principal management problems are controlling water erosion and maintaining structure and fertility. Control of brush and weeds is needed if the soil is used for pasture. Terraces, contour farming, and close-growing crops are needed if the soil is cultivated. Management of crop residue helps to control erosion and to maintain structure and fertility. Crops respond well to fertilization and liming. (Capability unit IIIe-5; woodland group 8; Smooth Chert Savannah range site)

Sallisaw complex, 8 to 30 percent slopes (SaF).—About 60 percent of this complex consists of Sallisaw soils, 25 percent of soils similar to Sallisaw soils, and 15 percent of other soils. Included in the areas mapped are small areas where the slope is 5 to 8 percent.

The Sallisaw soils in this complex are shallower over gravelly clay loam than is typical. The soils that are similar to the Sallisaw soils have a strongly acid subsoil, or are underlain by shale rather than gravel, or are only 24 to 30 inches deep over gravel. Some of the soils that are unlike the Sallisaw soils consist of 4 to 20 inches of loam or clay loam over shale or sandstone, and some are very gravelly at the surface and throughout the profile.

This complex is not suited to cultivated crops, because the soils are too shallow or too sloping. It is used for woodland range and tame pasture. A vegetative cover is needed for control of erosion. Tame pasture plants respond well to fertilization and liming. (Capability unit VIe-3; woodland group 6; Smooth Chert Savannah range site)

Sogn Series

The Sogn series consists of very shallow to shallow, moderately slowly permeable, somewhat excessively drained soils on uplands. These soils occur in the north-central and northwestern parts of the county. They formed in material weathered from limestone.

Soils of the Sogn series typically have a surface layer of dark-gray silty clay loam that is underlain by limestone at a depth of 4 to 12 inches.

These soils are used for range. The vegetation consists of open stands of scrubby hardwoods and an understory of native grasses. Some of the common trees are hawthorn, persimmon, ash, and oak.

Representative profile of a Sogn silty clay loam, 400 feet west and 300 feet south of the NE. corner of SE¼ sec. 21, T. 13 N., R. 23 E.

A1—0 to 7 inches, dark-gray (10YR 4/1) silty clay loam, very dark gray (10YR 3/1) when moist; moderate, medium and fine, granular structure; friable when moist, hard when dry; many limestone pebbles as much as 3 inches in diameter; mildly alkaline; clear, irregular boundary. 4 to 12 inches thick.

R—7 to 31 inches +, horizontally bedded, fractured limestone; crevices, which make up less than 10 percent of this layer, contain dark grayish-brown silty clay loam.

The texture of the A1 horizon ordinarily is silty clay loam, but in places it is clay loam. The color ranges from dark grayish brown to black. The reaction ranges from neutral to moderately alkaline.

Sogn soils are much thinner than Summit soils. They formed in material weathered from limestone, unlike the Collinsville

and Hector soils, which formed in material weathered from sandstone.

Sogn complex, 10 to 25 percent slopes (SmF).—About 35 percent of this complex consists of Sogn soils; about 60 percent of deeper, more strongly developed soils; and about 5 percent of Hector-Linker-Enders complex, 5 to 40 percent slopes. Fragments of limestone cover 5 to 50 percent of the surface. The fragments range from gravel to boulders. Included in the areas mapped are limestone escarpments, slopes of 5 to 10 percent, and slopes of 25 to 40 percent.

The Sogn soils in this complex have the profile described as representative of the series. The deeper soils have an A1 horizon of silty clay loam and a B2t horizon of heavy silty clay loam to silty clay. The A1 horizon ranges from dark grayish brown or olive gray to black, and the B2t horizon from yellowish brown or olive to very dark grayish brown or, in a few places, yellowish red. The B2t horizon is dominantly moderately alkaline, but in places the reaction is strongly acid. In some places fragments of limestone are numerous throughout the profile. The substratum ranges from massive limestone to shaly siltstone and shale. The depth to the substratum is commonly between 20 and 60 inches.

This complex is not suited to cultivated crops or tame pasture. It is suited to range. The vegetation consists of low-quality hardwoods and native grasses. Enough plant cover to control erosion is needed. (Capability unit VIIs–4; Sogn part is in the Very Shallow range site; the deeper soils are in the Loamy Savannah range site)

Spiro Series

The Spiro series consists of moderately deep to deep, moderately permeable, well-drained soils on uplands. These soils occur mainly in the south-central and southwestern parts of the county. They formed in material weathered from sandstone, siltstone, and shale.

Soils of the Spiro series typically have a surface layer of grayish-brown silt loam and a transitional subsurface layer of brown heavy silt loam. The subsoil is light yellowish-brown light silty clay loam. It is underlain by sandstone.

These soils are fairly extensive. They are important for pasture and range. The vegetation is mostly native and tame grasses.

Representative profile of Spiro silt loam, 1,000 feet south and 700 feet west of the NE. corner of sec. 35, T. 12 N., R. 22 E.

A1—0 to 9 inches, grayish-brown (10YR 5/2) silt loam, very dark grayish brown (10YR 3/2) when moist; weak, fine, granular structure; friable when moist, hard when dry; strongly acid; gradual, smooth boundary. 7 to 13 inches thick.

AB—9 to 12 inches, brown (10YR 5/3) heavy silt loam, dark brown (10YR 4/3) when moist; weak, fine, granular structure; friable when moist, hard when dry; strongly acid; gradual, smooth boundary. 2 to 6 inches thick.

B2t—12 to 24 inches, light yellowish-brown (10YR 6/4) light silty clay loam, dark yellowish brown (10YR 4/4) when moist; weak, fine, subangular blocky structure; friable when moist, hard when dry; clay films in pores and on some ped faces; few, distinct, yellowish-red and strong-brown mottles; few reddish-yellow and black concretions; few pebbles; very strongly acid; clear, wavy boundary. 10 to 30 inches thick.

B3 & R—24 to 27 inches, fractured fine-grained sandstone that contains crevices filled with light yellowish-brown light silty clay loam; few yellowish-red mottles; few strong-brown and black concretions; strongly acid; gradual, irregular boundary. 0 to 10 inches thick.

R—27 to 36 inches +, sandstone.

The A1 horizon is ordinarily silt loam, but in places it is loam. The color ranges from brown to grayish brown. The B2t horizon ranges from light to medium silty clay loam in texture. It is generally yellow to brown in color, but in a few places is strong brown. It is strongly acid to very strongly acid. The depth to bedrock is less than 30 inches in most places, but it ranges from 20 to 48 inches.

Spiro soils are not so deep as Vian soils. They are siltier than Linker and Pickwick soils.

Spiro silt loam, 2 to 5 percent slopes (SnC).—This soil is well drained. Included in mapping were small areas of Collinsville soils, which make up about 10 percent of the acreage; areas of soils that are similar to Spiro soils but are deeper or have a reddish-brown subsoil; areas of soils that have a subsoil of heavy silty clay loam; and small areas of Vian silt loam.

This soil is suited to tame pasture, native grasses, and small grain. Other crops commonly grown are sorghum, soybeans, sericea lespedeza, and garden crops. Erosion control measures are needed if cultivated crops are grown. Brush control and weed control are needed if the soil is used for tame pasture. Management that will maintain structure and fertility is desirable. Fertilization and liming are normally beneficial. (Capability unit IVe–1; Loamy Prairie range site)

Stigler Series

The Stigler series consists of deep, very slowly permeable, somewhat poorly drained soils on uplands. These soils occur mainly as broad areas throughout the southern part of the county. They formed in clayey shale residuum, alluvium, and loess. Mounds 25 to 75 feet in diameter and 1 foot to 4 feet in height cover 5 to 25 percent of the surface.

Soils of the Stigler series typically have a surface layer of silt loam that is light brownish gray. The subsurface layer is very pale brown silt loam. The upper part of the subsoil is very pale brown silty clay loam, and the lower part is brownish-yellow silty clay loam or clay that is mottled with gray and red. Shale is at a depth of about 67 inches.

These soils are important for farming. Some areas are used for meadow, pasture, and cultivated crops. Other areas support open stands of hardwoods and a ground cover of native grasses.

Representative profile of Stigler silt loam, 300 feet south and 550 feet east of the NW. corner of SW¼ sec. 11, T. 11 N., R. 24 E.

A1—0 to 9 inches, light brownish-gray (10YR 6/2) silt loam, dark grayish brown (10YR 4/2) when moist; weak, fine, granular structure; friable when moist, hard when dry; few, small, brownish-yellow and black concretions; strongly acid; gradual, smooth boundary. 4 to 14 inches thick.

A2—9 to 18 inches, very pale brown (10YR 7/3) silt loam, brown (10YR 5/3) when moist; weak, fine, granular structure; friable when moist, hard when dry; few, fine, faint, brownish-yellow mottles; few, small, brownish-yellow and black concretions; very strongly acid; gradual, wavy boundary. 8 to 20 inches thick.

B21t—18 to 24 inches, very pale brown (10YR 7/4) silty clay loam, yellowish brown (10YR 5/4) when moist; weak, fine, subangular blocky structure; friable when moist,

hard when dry; few, fine, distinct, strong-brown mottles; common, fine, brownish-yellow and black concretions; discontinuous clay films; very strongly acid; clear, wavy boundary. 4 to 9 inches thick.

B22t--24 to 41 inches, brownish-yellow (10YR 6/6) heavy silty clay loam, yellowish-brown (10YR 5/6) when moist; moderate, fine, blocky structure; firm when moist, very hard when dry; discontinuous clay films; few, small, brownish-yellow and black concretions; common, distinct, light brownish-gray and red mottles; strongly acid; diffuse, wavy boundary. 12 to 24 inches thick.

B23t--41 to 67 inches, mottled brownish-yellow (10YR 6/6) and light-gray (10YR 7/1) heavy silty clay loam; weak, fine, blocky structure; firm when moist, very hard when dry; discontinuous clay films; common, brownish-yellow and black concretions; common, yellowish-red and red mottles in the upper part; neutral; clear, irregular boundary. 10 to 36 inches thick.

R—67 to 74 inches +, gray, black, and yellowish-brown, mildly alkaline shale.

The A horizon is 14 to 30 inches thick. The color of the A1 horizon ranges from light gray to light brownish gray, and that of the A2 horizon from very pale brown to light gray. The texture of the B21t horizon ranges from silty clay loam to clay loam, and the color from yellow to very pale brown. This horizon does not occur in all profiles. The texture of the B22t horizon ranges from heavy clay loam, through heavy silty clay loam, to light silty clay or light clay. This horizon is mottled; its base color ranges from brownish yellow to brown. The color range of the mottles includes light gray, gray, grayish brown, red, reddish brown, strong brown and reddish yellow. The B22t horizon is strongly acid to very strongly acid. The B23t horizon is strongly acid to neutral. The depth to shale ranges from 4 to 20 feet.

Stigler soils have a more clayey subsoil than Vian soils. Their subsoil is less grayish than that of Wrightsville soils.

Stigler silt loam, 0 to 1 percent slopes (SrA).—This soil is seasonally wet because it is nearly level, has mounds on the surface that retard runoff, and has very slow permeability in the subsoil. Included in the areas mapped are small areas of Vian silt loam and of Wrightsville silt loam. Also included are mounded areas where the surface layer is more than 30 inches thick.

This soil is used mainly for cultivated crops, tame and native pasture, and meadow. Suitable crops are small grain, sorghum, and soybeans. A mixture of bermudagrass and legumes is one of the main pasture crops. A mixture of tall fescue and legumes also provides good forage.

Growing small grain continuously and managing the residue so as to improve tilth, preserve soil structure, and maintain productivity is an example of a suitable cropping system. In some places crop rows can be so arranged that the furrows help to drain the soil. Fertilization and liming are usually beneficial. (Capability unit IIs–1; Loamy Savannah range site)

Stigler silt loam, 1 to 3 percent slopes (SrB).—This soil is seasonally wet. Included in the areas mapped are small areas of Vian silt loam, 1 to 3 percent slopes, which make up about 12 percent of the acreage. Also included are small areas of McKamie loam and mounded areas where the surface layer is more than 30 inches thick.

This soil is used for cultivated crops, tame and native pasture, and meadow. Suitable crops are small grain, sorghum, and soybeans.

A cropping system that helps to control erosion is needed. An example of a suitable system is double cropping small grain with soybeans or sorghum and using enough fertilizer to produce residue in amounts adequate for soil protection. If row crops are grown, terracing and contour farming are needed. The mounded areas too irregular for terracing are more suitable for tame pasture or sown crops. Fertilization, liming, and use of crop residue help to maintain structure and productivity. Erosion is a hazard. (Capability unit IIe–2; Loamy Savannah range site)

Stigler silt loam, 2 to 5 percent slopes, eroded (SrC2).—Erosion has thinned the surface layer of this soil and created rills and a few gullies. The thickness of the surface layer varies considerably within short distances. In about 65 percent of the acreage, the surface layer is 16 to 24 inches thick; in 25 percent it is 6 to 16 inches thick; and in 10 percent it is 1 to 6 inches thick and generally contains some material from the subsoil. This layer is generally thinnest near rills and gullies. Included in the areas mapped are small areas of Vian silt loam.

This soil is suited to close-growing crops, tame pasture plants, and native grasses. A mixture of bermudagrass and legumes makes a good pasture.

The principal management problems are controlling water erosion and preventing further deterioration of fertility and structure. Growing small grain year after year and using the residue for soil maintenance is an example of a suitable cropping system. Terracing and contour farming are needed if cultivated crops are grown. The mounds make terracing difficult. Crops and pasture plants respond well to fertilization and liming. (Capability unit IIIe–4; Loamy Savannah range site)

Stigler-Wrightsville silt loams, 0 to 1 percent slopes (SoA).—The soils in this complex are deep and are somewhat poorly drained or poorly drained. About 55 percent of the acreage consists of Stigler silt loam, 30 percent of Wrightsville silt loam, and 15 percent of soils like the Wrightsville soil except that the surface layer is more than 20 inches thick. Included in the areas mapped are small areas where the slope is slightly more than 1 percent, and small areas of Vian silt loam.

These soils are not well suited to cultivated crops, because they are dry at some times and wet at other times. They can be used for small grain and soybeans, but they are better suited to tame pasture or meadow. The natural fertility is moderate to low. Many areas of the Wrightsville soil are ponded during wet periods, and the wetness often prevents establishment of good stands of crops. The mounded relief retards runoff. In some places crop rows can be so arranged that the furrows help to drain the soil.

If cultivated crops are grown, the proper use of crop residue is needed to maintain soil structure and fertility. Fertilization and liming are normally beneficial. Brush control is needed if tall fescue or a bermudagrass-legume mixture is grown for pasture. (Capability unit IIIw–2; the Stigler soil is in the Loamy Savannah range site; the Wrightsville soil is in woodland group 4)

Strip Mines

Strip mines (St) consists of dumps and trenches that remain after coal has been mined. This land type occurs in the south-central and southwestern parts of the county. The areas vary in width from 700 to 1,500 feet. The largest area, broken only by roads and streams, is about 7 miles long. The dumps, which are very hummocky, consist principally of black shale. The trenches are 100 to 200 feet wide and 50 to 90 feet deep. They usually hold water that rises to within 15 to 25 feet of ground level.

In some places the dumps are becoming vegetated. The vegetation is sparse in most places, however, and although the areas are included with pasture land, they provide only a limited amount of forage. These areas are not suited to cultivated crops or tame pasture. (Capability unit VIIs–5)

Summit Series

This series consists of deep, slowly permeable, moderately well drained soils on uplands. These soils occur in the northwestern part of the county. They formed in material weathered from limestone.

Soils of the Summit series typically have a surface layer of very dark gray silty clay loam and a subsoil of very dark gray heavy silty clay loam over dark-gray to gray light silty clay and grayish-brown silty clay loam.

These soils are used for general farming and tame pasture. A few areas are in native grass.

Representative profile of Summit silty clay loam, 200 feet south and 100 feet east of the NW. corner of SW¼ sec. 21, T. 13 N., R. 21 E.

A1—0 to 9 inches, very dark gray (10YR 3/1) silty clay loam, black (10YR 2/1) when moist; moderate, very fine, subangular blocky structure; firm when moist, hard when dry; many worm casts; slightly acid; gradual, smooth boundary. 7 to 12 inches thick.

B1—9 to 18 inches, very dark gray (10YR 3/1) heavy silty clay loam, black (10YR 2/1) when moist; strong, very fine, subangular blocky structure; firm when moist, hard when dry; many worm casts; neutral; gradual, smooth boundary. 6 to 12 inches thick.

B21t—18 to 24 inches, dark-gray (10YR 4/1) light silty clay, very dark gray (10YR 3/1) when moist; moderate, fine, subangular blocky structure; firm when moist, very hard when dry; discontinuous clay films; few worm casts; few, distinct, yellowish-brown mottles in upper part that increase with depth; few, small, yellowish-brown and black concretions; neutral; diffuse, smooth boundary. 9 to 16 inches thick.

B22t—24 to 50 inches, gray (10YR 5/1) light silty clay, dark gray (10YR 4/1) when moist; moderate, fine, blocky structure; very firm when moist, very hard when dry; discontinuous clay films; common, distinct, yellowish-brown mottles; few, small, brownish-yellow, black, and gray concretions; mildly alkaline; diffuse, smooth boundary. 18 to 35 inches thick.

B3—50 to 72 inches +, grayish-brown (2.5Y 5/2) silty clay loam, dark grayish brown (2.5Y 4/2) when moist; moderate, fine, blocky structure; very firm when moist, very hard when dry; few clay films; many, fine, distinct, yellowish-brown mottles; many, small, brownish-yellow, black, and gray concretions; mildly alkaline.

The texture of the A1 horizon is ordinarily silty clay loam, but in places it is light clay loam. The color of both the A1 and B1 horizons ranges from dark gray to very dark gray. The texture of the B1 horizon is silty clay loam or heavy silty clay loam. The texture of the B2t horizon is dominantly light silty clay, but in places it is heavy silty clay loam. The color ranges from grayish brown through dark gray to very dark grayish brown. This horizon is medium acid to mildly alkaline. The B3 horizon ranges from grayish brown to gray in color and from silty clay loam to light silty clay in texture. The depth to limestone ranges from 4 to 10 feet.

Summit soils are deeper and more strongly developed than Sogn soils.

Summit silty clay loam, 1 to 3 percent slopes (SuB).—This soil has the profile described as typical of the Summit series. Included in the areas mapped are spots of soils that are similar but have a surface layer of loam and a subsoil of clay loam. Also included are small areas where the depth to limestone is only 24 inches.

This soil is suited to corn, cotton, small grain, sorghum, and soybeans. It is well suited to tame pasture and native grasses. An example of a suitable cropping system is double cropping small grain with soybeans or sorghum. Adequate amounts of fertilizer should be added, and the crop residue used for soil maintenance and as a source of organic matter. If row crops are grown, terracing and contour farming are needed to control erosion and maintain structure and fertility. Fertilization is normally beneficial. (Capability unit IIe–2; Loamy Prairie range site)

Summit silty clay loam, 3 to 5 percent slopes (SuC).—The areas mapped as this soil include small areas where the surface layer is loam and the subsoil is clay loam, areas where limestone is at a depth of 24 inches, and small areas that are moderately eroded.

This soil is suited to cotton, corn, small grain, sorghum, and soybeans. It is also suited to tame pasture and native grasses. The natural fertility is moderate.

The principal management problems are controlling water erosion and maintaining structure and fertility. An example of a suitable cropping system is continuous small grain; another is row crops grown in sequence with legumes. The crop residue should be used to maintain fertility and tilth. After rainfall, tillage must be delayed somewhat longer than on well-drained soils that have a less clayey surface layer. If the soil is tilled when it is neither too wet nor too dry, the hazard of soil compaction is lessened and seed emergence is encouraged. If cultivated crops are grown, terraces are needed. Fertilization is normally beneficial. (Capability unit IIIe–1; Loamy Prairie range site)

Vian Series

The Vian series consists of deep, moderately slowly permeable, moderately well drained soils on uplands. These soils occur mainly in the south-central and northwestern parts of the county. They formed in loamy alluvium or in loess. Mounds 25 to 75 feet in diameter and 1 to 4 feet in height cover 5 to 20 percent of the surface.

Soils of the Vian series typically have a surface layer of silt loam that is light brownish gray in the upper part and light gray in the lower part. The uppermost part of the subsoil is very pale brown heavy silt loam. Below this is brownish-yellow silty clay loam, and below this, coarsely mottled light-gray, very pale brown, and yellow silty clay loam.

Some of these areas have been cleared and used for meadow, tame pasture, and cultivated crops. Only a small acreage is presently cultivated. In some of the areas, the vegetation consists of scattered hardwood trees and native grasses.

Representative profile of Vian silt loam, 400 feet west and 100 feet south of the NE. corner of sec. 22, T. 12 N., R. 22 E.

A1—0 to 10 inches, light brownish-gray (10YR 6/2) silt loam, dark grayish brown (10YR 4/2) when moist; weak, fine, granular structure; friable when moist, hard when dry; few, faint, yellowish-brown mottles; strongly acid; gradual, smooth boundary. 7 to 13 inches thick.

A2—10 to 18 inches, light-gray (10YR 7/2) silt loam, brown (10YR 5/3) when moist; weak, fine, granular structure; friable when moist, hard when dry; few, faint, yellowish-brown mottles; very strongly acid; gradual, smooth boundary. 6 to 17 inches thick.

B1—18 to 26 inches, very pale brown (10YR 7/4) heavy silt loam, yellowish brown (10YR 5/4) when moist; weak,

very fine, subangular blocky structure; friable when moist, hard when dry; few strong-brown mottles; few, soft, yellowish-brown and black concretions; very strongly acid; clear, smooth boundary. 5 to 11 inches thick.

B21t—26 to 48 inches, brownish-yellow (10YR 6/6) silty clay loam, yellowish brown (10YR 5/6) when moist; moderate, fine, subangular blocky structure; firm when moist, hard when dry; distinct, light-gray coatings on some ped faces; few distinct, light-gray mottles; common, distinct, reddish-brown mottles in the upper part; clay films in pores and on some ped faces; some tonguing of material from the A2 horizon; few, small, yellowish-brown and black concretions; very strongly acid; diffuse, smooth boundary. 16 to 28 inches thick.

B22t—48 to 72 inches +, coarsely mottled light-gray (10YR 7/1), very pale brown (10YR 7/3), and yellow (10YR 7/6) silty clay loam; weak, medium, subangular blocky structure; few clay films; firm when moist, hard when dry; many yellowish-brown and black concretions; strongly acid.

The color of the A1 horizon ranges from light brownish gray to grayish brown, and that of the A2 horizon from very pale brown to light brownish gray. The combined thickness of the A1 and A2 horizons ranges from 16 to 30 inches. The range of texture of the B1 horizon includes heavy silt loam, heavy loam, light silty clay loam, and light clay loam. The color of this horizon ranges from yellow to light yellowish brown. The B21t horizon ranges from silty clay loam to clay loam in texture and from yellow to light yellowish brown in color. The mottles in this horizon are gray, reddish yellow, reddish brown, and red. The reaction is strongly acid to very strongly acid. The B22t horizon is mottled and ranges from gray to yellow.

Vian soils are better drained and less clayey in the subsoil than Stigler soils. They are less reddish in the subsoil than Linker and Pickwick soils and are siltier throughout than those soils.

Vian silt loam, 1 to 3 percent slopes (VaB).—The areas mapped as this soil include small areas of Stigler silt loam, 1 to 3 percent slopes; Spiro silt loam, 2 to 5 percent slopes; and mounded areas where the surface layer is more than 30 inches thick.

This soil is suited to corn, cotton, small grain, sorghum, and soybeans. It is also suited to tame pasture, native grasses, and meadow.

The principal management problems are controlling water erosion and maintaining structure and fertility. An example of a suitable cropping system is growing small grain year after year. Adequate amounts of fertilizer should be applied and the crop residue used for control of erosion, for maintenance of structure and fertility, and as a source of organic matter. If row crops are grown on the smoother slopes, terracing and contour farming are needed. Where mounds are common, they hinder establishment of suitable terraces. Such mounded areas are better suited to tame pasture or sown crops. Liming is normally beneficial. (Capability unit IIe–1; Loamy Savannah range site)

Vian silt loam, 3 to 5 percent slopes (VaC).—The areas mapped as this soil include small areas of Spiro silt loam, 2 to 5 percent slopes; areas of Collinsville complex, 5 to 20 percent slopes; soils that are similar to Vian soils but are underlain by sandstone at a depth of about 40 inches; and mounded areas where the surface layer is more than 30 inches thick.

This soil is suited to cultivated crops, tame pasture, native grasses, and meadow.

The principal management problems are controlling erosion and maintaining structure and fertility. An example of a suitable cropping system is growing crops that produce enough residue to maintain structure and fertility and control erosion. If row crops are grown, terracing and contour farming are needed. In much of the acreage, irregular relief hinders establishment of terraces. In such areas close-growing crops or grass are better suited than row crops. Fertilization and liming are normally beneficial. (Capability unit IIIe–2; Loamy Savannah range site)

Wrightsville Series

The Wrightsville series consists of deep, very slowly permeable, poorly drained soils on uplands. These soils occur along the larger streams throughout the county. They formed in old alluvium. Mounds 25 to 75 feet in diameter and 1 to 4 feet in height cover 5 to 25 percent of the surface. In Sequoyah County, Wrightsville soils are mapped only in a complex with Stigler soils.

Soils of the Wrightsville series typically have a surface layer of silt loam that is light gray in the upper part and white in the lower part. The subsoil consists of light-gray silty clay and heavy silty clay loam over mottled heavy silty clay loam.

This soil is used mainly for pasture. A few areas are cultivated. Some areas support hardwood forest; others support open stands of hardwoods and a ground cover of native grasses.

Representative profile of a Wrightsville silt loam, 425 feet south and 200 feet east of the NW. corner of SW¼ sec. 35, T. 13 N., R. 26 E.

A1—0 to 3 inches, light-gray (10YR 7/2) silt loam, grayish brown (10YR 5/2) when moist; weak, fine, granular structure; friable when moist, hard when dry; few, faint, brownish-yellow mottles; very strongly acid; clear, smooth boundary. 1 to 7 inches thick.

A2—3 to 14 inches, white (10YR 8/1) silt loam, gray (10YR 6/1) when moist; weak, fine, granular structure; friable when moist, hard when dry; common, distinct, yellowish-brown mottles; very strongly acid; abrupt, wavy boundary. 6 to 13 inches thick.

B21t—14 to 25 inches, light-gray (10YR 7/1) light silty clay, gray (10YR 6/1) when moist; moderate, fine, blocky structure; very firm when moist, very hard when dry; some material from the A2 horizon on ped faces in the upper 4 inches of the horizon; common, faint, gray mottles and common, distinct, yellowish-brown mottles; discontinuous clay films; very strongly acid; gradual, smooth boundary. 7 to 20 inches thick.

B22t—25 to 39 inches, light-gray (10YR 7/1) heavy silty clay loam, gray (10YR 6/1) when moist; moderate, fine, blocky structure; firm when moist, very hard when dry; many, distinct mottles of dark gray, yellowish brown, brownish yellow, yellowish red, and red; discontinuous clay films; very strongly acid; gradual, smooth boundary. 10 to 15 inches thick.

B3—39 to 60 inches +, coarsely mottled light-gray, gray, and yellowish-brown, variegated soil material averaging heavy silty clay loam in texture; few fine mottles of red, reddish yellow, and dark gray; moderate, fine, blocky structure; firm when moist, very hard when dry; scattered clay films; few pebbles; very strongly acid.

The color of the A1 horizon ranges from light gray to gray, and that of the A2 horizon from white to light gray. The texture of the A1 and A2 horizons is ordinarily silt loam, but in places it is loam. The matrix color of the B2t horizon is light gray to gray. The texture of this horizon ranges from heavy silty clay loam to silty clay. This horizon is strongly acid to very strongly acid. Mottles, which are few to many, are yellowish brown, brownish yellow, dark gray, yellowish red, red, strong brown, and grayish brown.

Wrightsville soils have a grayer subsoil than Stigler soils

Yahola Series

The Yahola series consists of deep, moderately rapidly permeable, well-drained soils on bottom lands. These soils occur on flood plains along the Arkansas River. They are subject to occasional damaging floods.

Soils of the Yahola series typically have a surface layer of brown fine sandy loam overlying a layer of light-brown light fine sandy loam. The substratum is pink light fine sandy loam. The soils are calcareous throughout.

These soils are important for farming. Most of the acreage is used for cultivated crops. Some areas are in mixed hardwood forest.

Representative profile of Yahola fine sandy loam, 2,200 feet south and 750 feet west of the NE. corner of sec. 34, T. 10 N., R. 25 E.

A1—0 to 19 inches, brown (7.5YR 5/4) fine sandy loam, dark brown (7.5YR 4/4) when moist; weak, fine, granular structure; very friable when moist, slightly hard when dry; calcareous; gradual, smooth boundary. 10 to 30 inches thick.

AC—19 to 49 inches, light-brown (7.5YR 6/4) light fine sandy loam, dark brown (7.5YR 4/4) when moist; massive; very friable when moist, slightly hard when dry; calcareous; gradual, wavy boundary. 20 to 40 inches thick.

C—49 to 76 inches +, pink (7.5YR 7/4) light fine sandy loam, brown (7.5YR 5/4) when moist; massive; very friable when moist, slightly hard when dry; calcareous.

The color throughout the profile ranges from pink to brown. The texture is ordinarily fine sandy loam but ranges to light very fine sandy loam. These soils are commonly stratified, especially below a depth of 30 inches. The stratified layers range from 1 to 5 inches in thickness and from fine sand to silty clay loam in texture. The color of the stratified layers is pale brown, pink, and dark grayish brown.

Yahola soils are calcareous, unlike the Cleora soils, which are medium acid to slightly acid, and the Robinsonville soils, which are medium acid to neutral. They are not so sandy as Crevasse soils.

Yahola fine sandy loam (0 to 3 percent slopes) (Ya).—This soil has the profile described as typical of the Yahola series. The slopes are short and irregular. Some small areas are nearly level. Included in the areas mapped are small areas of Crevasse soils.

This soil is well suited to alfalfa, corn, cotton, small grain, sorghum, soybeans, spinach, and tame pasture. The natural fertility is moderately high.

Management is needed that will maintain structure and fertility. An example of a suitable cropping system is double cropping soybeans and small grain year after year. The crop residue should be returned to the soil. If large amounts of grain stubble are returned, nitrogen is needed to speed decomposition. Crops normally respond well to fertilization. Lime is not needed. (Capability unit IIw–2; woodland group 2)

Yahola complex (0 to 2 percent slopes) (Yh).—This complex consists of Yahola soils and soils that have a subsurface layer of clay. The Yahola soils are underlain by calcareous clay at a depth of 30 to 50 inches. Otherwise the profile is like the one described as typical of the series. The clay layer is dark brown to dark reddish brown and is 20 to more than 50 inches thick. Yahola fine sandy loam makes up nearly half of this complex; soils that are similar but are only 12 to 30 inches deep over clay also make up nearly half. Included in the areas mapped are small areas of fine sandy loam where the underlying clay is at a depth of less than 12 inches. Also included are small areas where the surface layer is very fine sandy loam. In places the slopes are short and irregular.

This complex is suited to alfalfa, small grain, soybeans, and tame pasture. The natural fertility is moderately high. In some places the layer of clay limits the penetration of roots.

Management that maintains structure and fertility is needed. An example of a suitable cropping system is double cropping soybeans and small grain year after year. If large amounts of small-grain stubble are returned to the soil, nitrogen is needed to speed decomposition. Fertilization is normally beneficial. Lime is not needed. (Capability unit IIw–2; woodland group 3)

Use and Management of the Soils

This section explains the system of capability classification used by the Soil Conservation Service and gives estimated yields of the principal crops grown in the county under two levels of management. The capability classification of each soil mapped in the county can be learned by referring to the "Guide to Mapping Units." Information about management needs of a particular soil is given in the section "Descriptions of the Soils."

This section also groups the soils according to their suitability for range and for woodland, and it discusses the use of the soils for wildlife. It contains a table that gives ratings of the soils for several nonfarm uses, and a section that gives information about soils significant in engineering.

Irrigation.—The use of irrigation is rapidly increasing in this county. In most years, irrigation can increase yields by 10 to 50 percent. Deep, loamy, permeable soils are suitable. Shallower, less permeable soils can be irrigated, but less satisfactorily. Some soils are not suitable for irrigation, because they are shallow, eroded, sloping, subject to flooding, or have other characteristics that limit their suitability. Most of the irrigated acreage is on bottom lands along the Arkansas River. Soils suitable for irrigation are of the Brewer, Cleora, Latanier, Lela, Linker, Lonoke, Mason, Miller, Muldrow, Pickwick, Razort, Robinsonville, Sallisaw, Spiro, Stigler, Summit, Vian, and Yahola series. Not all of the mapping units of each series are suitable.

Each irrigation system must be individually designed. The main factors to be considered are the cost of the system, the quality and quantity of the available water, the suitability of the soils, the needs of the crop to be grown, and the available labor. Advice in planning an irrigation system should be obtained from technicians at the local offices of the Soil Conservation Service or from a qualified engineer.

Tame pasture.—A well-managed pasture program provides economical feed for livestock both in summer and in winter. Planning such a program should take into account the suitability of the soil for pasture, the season when additional forage is needed, and the most suitable grasses and legumes. If grazing is properly managed and brush and weeds are controlled, yields are higher and the stands last longer.

Perennial grasses are the basic forage plants in all permanent pastures. These are usually grown in a mixture with legumes. To provide good forage, grass should make up 60 to 80 percent of the mixture. Bermudagrass, annual

lespedeza, and yellow hop clover are generally grown for summer pasture on such well-drained soils as Sallisaw loam. A mixture of tall fescue and Ladino clover provides forage late in fall and winter and early in spring on such poorly drained soils as Rosebloom silt loam.

Capability Classification

Capability classification is the grouping of soils to show, in a general way, their suitability for farming. It is based on the limitations of the soils, the risk of damage when they are used, and the way they respond to treatment when used for the common field crops and forage crops. The classification does not apply to most horticultural crops or to rice and other crops that have special requirements. The soils are classified according to the degree and kind of permanent limitation, but without considering major and generally expensive alterations that could be made in slope, depth, or other characteristics of the soil; and without consideration of possible but unlikely major reclamation projects.

In the capability system, all kinds of soils are grouped at three levels: the capability class, the subclass, and the unit. The eight capability classes in the broadest grouping are designated by Roman numerals I through VIII. In Class I are the soils that have few limitations, the widest range of use, and the least risk of damage when they are used. The soils in the other classes have progressively greater natural limitations. In Class VIII are soils and landforms so rough, shallow, or otherwise limited that they do not produce worthwhile yields of crops, forage, or wood products. In this county, there are no soils classified as VIII.

The subclasses indicate the major kinds of limitations within the classes. Within most of the classes there can be as many as four subclasses. The subclass is indicated by adding a small letter, *e*, *w*, *s*, or *c*, to the class numeral, for example, IIe. The letter *e* shows that the main limitation is risk of erosion unless close-growing plant cover is maintained; *w* means that water in or on the soil interferes, with plant growth or cultivation (in some soils the wetness can be partly corrected by artificial drainage); *s* shows that the soil is limited mainly because it is shallow, droughty, or stony; and *c*, used in only some parts of the country, indicates that the chief limitation is climate that is too cold or too dry.

In Class I there are no subclasses, because the soils of this class have few or no limitations. Class V can contain, at the most, only subclasses *w*, *s*, and *c*, because the soils in it are subject to little or no erosion but have limitations that restrict their use largely to pasture, range, woodland, or wildlife.

Within the subclasses are the capability units, which are groups of soils enough alike to be suited to the same crops and pasture plants, to require similar management, and to have similar productivity and other responses to management. Thus, the capability unit is a convenient grouping for making many statements about management of soils. Capability units are generally identified by numbers assigned at State level, for example, IIe-1 or IIIw-2. To find the capability classification of any given soil, refer to the "Guide to Mapping Units."

The eight classes in the capability system and the subclasses and units in Sequoyah County are described in the list that follows.

Class I. Soils that have few limitations that restrict their use.
- Unit I-1. Deep, nearly level to very gently sloping, moderately permeable to slowly permeable, well drained to moderately well drained soils of bottom lands.
- Unit I-2. Deep, level to very gently sloping, moderately rapidly permeable, well-drained soils of bottom lands.

Class II. Soils that have moderate limitations that reduce the choice of plants or require moderate conservation practices.
- Subclass IIe. Soils that are subject to moderate erosion if they are not protected.
  - Unit IIe-1. Deep, very gently sloping, moderately slowly permeable, moderately well drained soils of uplands.
  - Unit IIe-2. Deep, very gently sloping, slowly permeable to very slowly permeable, moderately well drained to somewhat poorly drained soils of uplands.
  - Unit IIe-3. Deep, undulating, moderately rapidly permeable, well-drained soils of bottom lands.
  - Unit IIe-4. Deep, very gently sloping, moderately permeable, well-drained soils of uplands.
  - Unit IIe-5. Deep, undulating, moderately slowly permeable, well-drained soils of bottom lands.
- Subclass IIw. Soils that have moderate limitations because of excess water.
  - Unit IIw-1. Deep, nearly level, very slowly permeable, somewhat poorly drained soils of bottom lands.
  - Unit IIw-2. Deep, nearly level to very gently sloping, moderately rapidly permeable, well-drained soils of bottom lands.
- Subclass IIs. Soils that have moderate limitations because of moisture capacity or tilth.
  - Unit IIs-1. Deep, nearly level, very slowly permeable, somewhat poorly drained soils of uplands.
  - Unit IIs-2. Deep, nearly level, moderately well drained to somewhat poorly drained soils of bottom lands.

Class III. Soils that have severe limitations that reduce the the choice of plants, require special conservation practices, or both.
- Subclass IIIe. Soils that are subject to severe erosion if they are cultivated and not protected.
  - Unit IIIe-1. Deep, gently sloping, slowly permeable, moderately well drained soils of uplands.
  - Unit IIIe-2. Deep, gently sloping, moderately slowly permeable, moderately well drained soils of uplands.
  - Unit IIIe-3. Deep, gently sloping, moderately permeable, well-drained soils of uplands.
  - Unit IIIe-4. Deep, very gently sloping to gently sloping, very slowly permeable, somewhat poorly drained soils of uplands.

Unit IIIe-5. Deep, very gently sloping to gently sloping, moderately permeable, well-drained soils of uplands.

Subclass IIIw. Soils that have severe limitations because of excess wetness.

Unit IIIw-1. Deep, nearly level, very slowly permeable, somewhat poorly drained soils of bottom lands.

Unit IIIw-2. Deep, nearly level, very slowly permeable, somewhat poorly drained to poorly drained soils of uplands.

Unit IIIw-3. Deep, nearly level, very slowly permeable, poorly drained soils of bottom lands.

Class IV. Soils that have very severe limitations that restrict the choice of plants, require very careful management, or both.

Subclass IVe. Soils that are subject to very severe erosion if they are cultivated and not protected.

Unit IVe-1. Very shallow to deep, very gently sloping to gently sloping, moderately permeable to rapidly permeable, well-drained to somewhat excessively drained soils of uplands.

Subclass IVs. Soils that have very severe limitations because of moisture capacity or tilth.

Unit IVs-1. Deep, undulating, rapidly permeable, somewhat excessively drained soils of bottom lands.

Class V. Soils that are not likely to erode, but that have other limitations, impractical to remove, that limit their use largely to pasture, range, woodland, or food and cover for wildlife.

Subclass Vw. Soils that are too wet for cultivation and for which drainage or protection is not feasible.

Unit Vw-1. Soils of bottom lands that are either flooded frequently or strongly dissected by stream channels, or both.

Class VI. Soils that have severe limitations that make them generally unsuitable for cultivation and that limit their use largely to pasture, range, woodland, or food and cover for wildlife.

Subclass VIe. Soils that have severe limitations, chiefly because of risk of erosion, if protective cover is not maintained.

Unit VIe-1. Very shallow to deep, sloping, rapidly permeable to moderately permeable, well-drained to somewhat excessively drained soils of uplands.

Unit VIe-2. Deep, sloping to strongly sloping, slowly permeable, well-drained soils of uplands.

Unit VIe-3. Deep, very gently sloping to sloping, moderately permeable to very slowly permeable, well-drained to somewhat poorly drained, severely eroded soils of uplands.

Subclass VIs. Soils that are generally unsuitable for cultivation and are limited for other uses by low moisture capacity, stones, or other soil features.

Unit VIs-1. Deep, nearly level to very gently sloping, very slowly permeable, somewhat poorly drained, upland soils that have low fertility and a high content of sodium.

Class VII. Soils that have very severe limitations that make them unsuitable for cultivation and that restrict their use largely to grazing, woodland, or wildlife.

Subclass VIIs. Soils that are very severely limited by moisture capacity, stones, or other soil features.

Unit VIIs-1. Very shallow to deep, sloping to moderately steep, moderately rapidly permeable to slowly permeable, well drained to moderately well drained soils of uplands.

Unit VIIs-2. Very shallow to deep, sloping to steep, moderately rapidly permeable to slowly permeable, somewhat excessively drained to moderately well drained soils of uplands.

Unit VIIs-3. Deep, moderately steep to steep, rapidly permeable, somewhat excessively drained, stony soils of uplands.

Unit VIIs-4. Very shallow to deep, strongly sloping to steep, slowly permeable to moderately slowly permeable, somewhat excessively drained to moderately well drained soils of uplands.

Unit VIIs-5. Dumps and trenches that remain after strip mining.

Class VIII. Soils and landforms that have limitations that preclude their use for commercial plant production and restrict their use to recreation, wildlife, or water supply, or to esthetic purposes. (There are no class VIII soils in Sequoyah County.)

Estimated Yields

The estimated average yields per acre of the principal crops grown in Sequoyah County, under two levels of management, are given in table 2. The estimates are based on farm records, on results of research on these and similar soils, and on observations made by soil scientists and agricultural workers who are familiar with the soils. The estimates in columns A can be expected under customary management, and those in columns B, under improved management.

The following are assumed to be part of a customary management system:

1. Seeding at proper rates and at proper times.
2. Using efficient methods of harvesting.
3. Controlling weeds, insects, and disease.
4. Terracing and contour farming where necessary.
5. Using small amounts of fertilizer.

In addition to the practices used under customary management, the following are assumed to be part of an improved management system:

1. Selecting suitable crop varieties.
2. Using fertilizer and lime in amounts indicated by soil tests.
3. Using surface drainage where needed.
4. Managing crop residue properly.
5. Using tillage methods that help to control erosion, preserve soil structure, improve infiltration, and promote emergence of seedlings.
6. Using a cropping system that will accomplish the farmer's objectives and that is suitable for the specific soil.

TABLE 2.—*Estimated average acre yields*

[Yields in columns A can be expected under customary management; yields in columns B can be expected under improved management. not suited to cultivated

Soil	Alfalfa		Barley		Corn	
	A	B	A	B	A	B
	Tons	*Tons*	*Bu.*	*Bu.*	*Bu.*	*Bu.*
Brewer silt loam	3. 0	4. 5	35	50	42	65
Cleora fine sandy loam	2. 7	4. 2	31	47	36	58
Crevasse soils	-----	-----	-----	-----	-----	-----
Lafe soils	-----	-----	-----	-----	-----	-----
Latanier clay	2. 5	4. 0	30	48	38	60
Lela clay	-----	-----	26	38	-----	-----
Linker-Hector complex, 2 to 5 percent slopes	-----	-----	20	28	20	36
Linker-Hector complex, 5 to 8 percent slopes	-----	-----	-----	-----	-----	-----
Linker and Stigler soils, 2 to 8 percent slopes, severely eroded	-----	-----	-----	-----	-----	-----
Lonoke loam, nearly level	3. 0	4. 5	35	50	42	65
Lonoke silty clay loam, level	3. 2	4. 5	37	50	45	65
Lonoke silty clay loam, undulating	2. 9	4. 5	34	49	40	64
Mason silt loam	2. 9	4. 5	34	50	41	65
McKamie loam, 5 to 12 percent slopes	-----	-----	-----	-----	-----	-----
Miller clay	2. 0	3. 8	28	43	30	52
Miller silty clay loam	2. 5	4. 0	30	48	38	60
Muldrow silty clay loam	2. 5	4. 0	30	48	38	60
Pickwick loam, 1 to 3 percent slopes	-----	-----	24	35	28	42
Pickwick loam, 3 to 5 percent slopes	-----	-----	22	31	25	38
Pickwick loam, 2 to 5 percent slopes, eroded	-----	-----	19	25	23	34
Razort fine sandy loam	2. 9	4. 5	34	50	41	65
Robinsonville fine sandy loam, level	2. 8	4. 3	33	48	38	60
Robinsonville fine sandy loam, undulating	2. 7	4. 2	31	47	36	58
Rosebloom silt loam, occasionally flooded	-----	-----	20	27	-----	-----
Rosebloom silt loam, frequently flooded	-----	-----	-----	-----	-----	-----
Rosebloom and Ennis soils, broken	-----	-----	-----	-----	-----	-----
Sallisaw loam, 1 to 3 percent slopes	1. 7	2. 6	26	37	30	44
Sallisaw loam, 3 to 5 percent slopes	-----	-----	23	33	27	40
Sallisaw loam, 2 to 5 percent slopes, eroded	-----	-----	20	27	25	35
Sallisaw complex, 8 to 30 percent slopes	-----	-----	-----	-----	-----	-----
Spiro silt loam, 2 to 5 percent slopes	-----	-----	21	28	21	37
Stigler silt loam, 0 to 1 percent slopes	-----	-----	26	38	30	45
Stigler silt loam, 1 to 3 percent slopes	-----	-----	26	37	30	44
Stigler silt loam, 2 to 5 percent slopes, eroded	-----	-----	20	27	25	35
Stigler-Wrightsville silt loams, 0 to 1 percent slopes	-----	-----	20	27	25	35
Summit silty clay loam, 1 to 3 percent slopes	1. 8	2. 7	28	40	28	42
Summit silty clay loam, 3 to 5 percent slopes	-----	-----	25	36	25	38
Vian silt loam, 1 to 3 percent slopes	-----	-----	26	37	30	44
Vian silt loam, 3 to 5 percent slopes	-----	-----	23	33	27	40
Yahola fine sandy loam	2. 7	4. 2	31	47	36	58
Yahola complex	2. 8	4. 3	33	48	38	60

[1] A.U.M. stands for animal unit month. The figures represent the number of months that 1 acre will provide grazing for 1 animal (1,000 pounds live weight), or the number of months the pasture can be grazed multiplied by the number of animal units an acre will support.

of cultivated crops and tame pasture

Absence of a yield figure indicates the crop is seldom grown or is not suited, or that the soil is not arable. Soils not listed in this table are crops or tame pasture]

Cotton		Grain sorghum		Oats		Common bermudagrass		Soybeans		Spinach		Wheat	
A	B	A	B	A	B	A	B	A	B	A	B	A	B
Lb. of lint	*Lb. of lint*	*Bu.*	*Bu.*	*Bu.*	*Bu.*	*A.U.M.*[1]	*A.U.M.*[1]	*Bu.*	*Bu.*	*Tons*	*Tons*	*Bu.*	*Bu.*
450	625	35	55	45	65	6.0	10.0	23	35	3.0	6.0	24	36
425	600	30	50	39	58	5.4	9.4	20	31	2.3	5.4	20	31
						4.0	7.5						
						2.0	3.5						
415	525	32	50	37	60	5.7	8.7	22	33	2.5	5.5	22	35
375	500	28	48	30	55	4.5	7.5	20	32			20	33
275	380	19	30	20	34	3.2	6.5	12	20			14	21
						2.8	4.4						
						2.3	4.0						
450	625	35	55	45	65	6.0	10.0	23	35	3.0	6.0	24	36
465	625	37	55	48	65	6.2	10.0	25	35	3.3	6.0	26	36
440	615	34	53	43	63	5.8	9.8	22	34	2.8	5.8	22	35
445	625	34	55	44	65	5.9	10.0	22	35	2.9	6.0	23	36
						3.0	5.0						
395	515	30	49	34	58	5.0	8.0	21	32	2.2	5.2	21	34
415	525	32	50	37	60	5.7	8.7	22	33	2.5	5.5	22	35
415	525	32	50	37	60	5.7	8.7	22	33	2.5	5.5	22	35
350	480	24	40	27	41	3.8	7.0	17	25			18	26
300	425	21	32	23	36	3.5	6.7	14	22			16	23
275	380	19	28	20	32	2.5	4.5	12	20			13	20
445	625	34	55	44	65	5.9	10.0	22	35	2.9	6.0	23	36
435	610	32	52	42	60	5.7	9.6	21	32	2.6	5.6	21	33
425	600	30	50	39	58	5.4	9.4	20	31	2.3	5.4	20	31
200	350	20	33	22	40	2.7	5.3	15	22			16	24
						2.6	5.3						
						4.2	7.8						
375	500	26	42	28	42	4.0	7.2	18	26			19	28
340	475	22	36	26	40	3.6	6.8	16	24			17	25
285	410	20	30	23	35	2.5	4.5	13	21			15	21
						3.0	5.0						
280	390	20	31	21	35	3.3	6.5	13	21			15	22
375	510	26	43	28	43	4.0	7.3	18	27			19	29
375	500	26	42	28	42	4.0	7.2	18	26			19	28
285	410	20	30	23	35	2.5	4.6	13	21			15	21
285	410	20	30	23	35	2.5	4.6	13	21			15	21
350	480	26	42	28	42	4.0	7.2	17	25			19	28
300	455	22	36	26	40	3.6	6.8	15	23			18	26
375	500	26	42	28	42	4.0	7.2	18	26			19	28
340	475	22	36	26	40	3.6	6.8	16	24			17	25
425	600	30	50	39	58	5.4	9.4	20	31	2.3	5.4	20	31
435	610	32	52	42	60	5.7	9.6	21	32	2.6	5.6	21	33

Range [1]

About 30 percent of the acreage of Sequoyah County is used for range. Generally, the deep, smooth soils are cultivated, and the shallow, steep, and stony soils are in range.

Most of the rangeland is in livestock farms, but there are a few large ranches. The raising of beef cattle is the main livestock enterprise. The range is usually grazed the year around, but the forage is supplemented with protein cubes, and hay and pasture consisting of tame grasses and small grain.

Range sites and condition classes

Effective range management requires knowledge of the capabilities of the different kinds of soils and the kinds and amounts of herbage that can be produced. It also requires the ability to evaluate the present condition of the range vegetation in relation to its potential for production.

For the purpose of classifying range resources, soils are placed in groups called range sites. Each site has a distinctive potential plant community, the composition of which depends upon a combination of environmental conditions, mainly the combined effects of soil and climate. The potential plant community reproduces itself so long as the environmental conditions remain the same.

The plants on a given site are grouped, according to their response to grazing, as decreasers, increasers, and invaders. Decreasers are plants in the potential plant community that tend to die out if they are heavily grazed. These plants are generally the most palatable and most productive perennials. Increasers are plants in the potential plant community that become more abundant as the decreasers decline. These plants are generally the shorter, less productive, less palatable plants. Under prolonged heavy grazing, the increasers become dominant. Invaders are plants that are not part of the potential plant community but that become established if both the decreasers and the increasers decline. They may be woody plants, herbaceous perennials, or annuals, and they may originate nearby or at a great distance.

Range condition refers to the composition of the existing native vegetation on a given site in relation to what the site is capable of producing. It is expressed in terms of condition classes. The condition class represents the degree to which the existing plant community is different from that of the potential plant community. It is determined by estimating the relative production, by weight, of the species making up the plant community.

A range site is in excellent condition if 76 to 100 percent of the present vegetation is of the same kind as the potential plant community for the site. It is in good condition if the percentage is between 51 and 75, in fair condition if the percentage is between 26 and 50, and in poor condition if the percentage is 25 or less.

A range site in excellent condition is at or near its maximum productivity. It has a plant cover that adequately protects the soil, encourages the absorption of moisture, and helps to maintain fertility. A site in good condition has lost some of its decreaser plants, but it is still productive and can be maintained and improved by good management. A site in fair condition has a severely altered plant community in which increasers are dominant and invaders are becoming prominent. Generally, the mulch is inadequate for protection against compaction and erosion. The exclusion of grazing animals for an entire season is usually necessary to bring about rapid improvement in condition of the range. A site in poor condition has lost almost all of the desirable forage plants. Few, if any, of the original range plants are left, and invaders are numerous.

Descriptions of range sites

The rangeland soils of Sequoyah County have been grouped in nine range sites. The soil series represented are named in the description of each site, but this does not mean that all the soils of a given series are in the site. The description of each range site gives significant soil characteristics, lists the principal range plants, and estimates annual herbage yields to be expected when the range is in excellent condition. The estimates are based on samples clipped at ground level and air dried. Woody plants were not included in the sampling.

To learn the range site for any given soil, refer to the "Guide to Mapping Units." In this county several of the soils are not assigned to a range site, because their potential use is primarily for woodland.

LOAMY PRAIRIE RANGE SITE

This range site consists of very gently sloping to moderately steep soils of the Spiro and Summit series and of unnamed soils mapped in a complex with Collinsville soils. Soils of this range site are moderately permeable to slowly permeable and have good capacity for moisture storage and root development. They have a loamy surface layer that has granular to subangular blocky structure.

This is the most productive of the upland range sites. When it is in excellent condition, about 80 percent of the vegetation consists of such decreasers as big bluestem, little bluestem, indiangrass, and switchgrass. About 5 percent consists of legumes and such forbs as tickclover, leadplant, gayfeather, and sunflower. About 15 percent is made up of increasers, among which are meadow dropseed, jointtail, purpletop, wild indigo, heath aster, Scribner panicum, sticky goldenrod, and Louisiana sagewort.

Openings in the ground cover are invaded by western ragweed, lanceleaf ragweed, narrowleaf sumpweed, common broomweed, white snakeroot, annual brome, annual three-awn, broomsedge, and splitbeard bluestem. In the low places, hawthorn and persimmon also invade.

The annual yield of herbage is about 6,500 pounds per acre in years when the amount of moisture is favorable and about 3,500 pounds per acre in years when the amount of moisture is unfavorable.

SHALLOW PRAIRIE RANGE SITE

This range site consists of the Collinsville soils in Collinsville complex, 5 to 20 percent slopes. These are shallow, moderately coarse textured soils. Sandstone is near the surface in most places. If the forage is not overgrazed, a good mulch forms, and this mulch improves the capacity of the soils to absorb water.

This site produces almost the same kind of vegetation as the Loamy Prairie range site, but the potential production is about 25 percent less. When the site is in excellent condition, about 70 percent of the vegetation consists of such decreasers as little bluestem, big bluestem, indian-

[1] By Neal Stidham, range conservationist, Soil Conservation Service.

grass, switchgrass, wildrye, tall dropseed, Virginia tephrosia, catclaw sensitivebrier, and perennial sunflower. About 30 percent of the vegetation is made up of increasers, among which are sideoats grama, meadow dropseed, silver bluestem, hairy grama, jointtail, ashy sunflower, heath aster, sticky goldenrod, coralberry, and sumac.

Openings in the ground cover are invaded by annual brome, three-awn, splitbeard bluestem, broomsedge bluestem, ragweed, broomweed, bitter sneezeweed, hawthorn, persimmon, coralberry, sumac, sticky goldenrod, hairy grama, side-oats grama, and silver bluestem.

The annual yield of herbage is about 5,000 pounds per acre in years when the amount of moisture is favorable and about 2,500 pounds per acre in years when the amount of moisture is unfavorable.

SLICKSPOT RANGE SITE

This range site consists of Lafe soils. It is surrounded by areas of Loamy Savannah range site. The soils have a low moisture-storage capacity and a slow rate of absorption. As a result of a concentration of salts and a subsoil of compact clay, the vegetation is limited to plants that tolerate salt and that resist drought.

When this site is in excellent condition, about 65 percent of the vegetation consists of such decreasers as little bluestem, switchgrass, and wildrye. About 35 percent of the vegetation is made up of increasers, among which are longspike tridens, meadow dropseed, Scribner panicum, sedges, and rushes. Common invaders are lanceleaf ragweed, narrowleaf sumpweed, bitter sneezeweed, and croton.

The annual yield of herbage is about 2,000 pounds per acre in years when the amount of moisture is favorable and about 1,000 pounds per acre in years when the amount of moisture is unfavorable.

VERY SHALLOW RANGE SITE

This range site consists of soils of Sogn complex, 10 to 25 percent slopes. These are very shallow, strongly sloping to moderately steep soils. There are a few pockets of moderately deep soil in the crevices. The moisture-storage capacity is limited. Flagstones are numerous on the surface.

When this site is in excellent condition, about 50 percent of the vegetation consists of big bluestem, little bluestem, indiangrass, switchgrass, compassplant, and perennial sunflower. The other half of the vegetation is made up mainly of increasers, among which are side-oats grama, silver bluestem, hairy grama, rough tridens, and purpletop. Trees native to the site are chinkapin oak, elm, and hackberry. If the range condition deteriorates, the brushy vegetation gets thicker and such invaders as broomweed and ragweed become prominent.

The annual yield of herbage is about 3,000 pounds per acre in years when the amount of moisture is favorable and about 1,500 pounds per acre in years when the amount of moisture is unfavorable.

LOAMY SAVANNAH RANGE SITE

This range site consists of soils of the McKamie, Stigler, and Vian series. Soils of this range site are moderately productive (fig. 9). These are upland soils. The original vegetation was dominantly grass, but there were open stands of trees.

When this site is in excellent condition, it has a cover of tall grasses and an open stand of post oak and blackjack

Figure 9.—An area of Vian silt loam in the Loamy Savannah range site. The range is in good condition.

oak. The woody species make up about 40 percent of the vegetation. Decreaser grasses and forbs make up about 40 percent, and increasers about 20 percent. The principal decreasers are big bluestem, little bluestem, switchgrass, indiangrass, beaked panicum, broadleaf uniola, and tickclover. Some of the common increasers are low panicum, purpletop, heath aster, goldenrod, hickory, cedar, and winged elm. Prolonged overgrazing encourages the growth of such invaders as broomsedge and annual three-awn, and such increasers as greenbrier, post oak, blackjack oak, and winged elm.

The annual yield of herbage is about 5,000 pounds per acre in years when the amount of moisture is favorable and about 2,500 pounds per acre in years when the amount of moisture is unfavorable.

SANDY SAVANNAH RANGE SITE

This range site consists of soils of the Enders, Hector, and Linker (fig. 10) series. Soils of this range site are moderately deep to deep, very gently sloping to steep, and moderately sandy. They occur on uplands.

When this site is in excellent condition, tall grasses and forbs make up about 55 to 60 percent of the vegetation. Woody species, mainly post oak, blackjack oak, red oak, and a few shortleaf pines, make up about 40 to 45 percent. The principal decreasers are big bluestem, little bluestem, indiangrass, and switchgrass.

When this site is in poor condition, the vegetation consists of dense stands of stunted post oak and blackjack oak, a sparse cover of broomsedge, and only a trace of decreaser plants.

The annual yield of herbage is about 5,000 pounds per acre in years when the amount of moisture is favorable and about 2,500 pounds in years when the amount of moisture is unfavorable.

SHALLOW SAVANNAH RANGE SITE

This range site consists of soils of the Hector series. Soils of this range site occur mainly on sloping to steep ridges. They are shallow and have rocks on the surface. The underlying sandstone limits moisture-storage capac-

Figure 10.—**An area of Linker loam in the Sandy Savannah range site. The range is in excellent condition.**

ity and restricts penetration of plant roots. Runoff is excessive if the range is in poor condition.

When this site is in excellent condition, the vegetation consists of open stands of post oak, blackjack oak, and hickories. Trees make up about 25 percent of the vegetation, and grasses, legumes, and forbs make up about 75 percent (fig. 11). The principal decreaser grasses are big bluestem, little bluestem, indiangrass, and switchgrass.

When this site is in poor condition, the grasses are replaced by oak seedlings and root sprouts, as well as weeds. Undesirable brush can be controlled by use of chemicals.

The annual yield of herbage is about 4,000 pounds per acre in years when the amount of moisture is favorable and about 2,000 pounds per acre in years when the amount of moisture is unfavorable.

SMOOTH CHERT SAVANNAH RANGE SITE

This range site consists of deep, loamy, well-drained soils of the Sallisaw series. Runoff is medium, and permeability is moderate. If a good vegetative cover is maintained, water is absorbed readily and there is little runoff.

When this site is in excellent condition, open stands of hardwoods make up about half the vegetation. The trees are mainly red oak, hickory, walnut, ash, sycamore, post oak, blackjack oak, and persimmon. If grazing has been properly controlled over a period of time, the main de-

Figure 11.—**Grasses, post oak, blackjack oak, and red oak on Shallow Savannah range site. The range is in excellent condition.**

creaser plants in the vegetative cover are big bluestem, little bluestem, indiangrass, slender lespedeza, and tickclover.

Blackjack oak, post oak, sassafras, and persimmon are abundant when this site is in poor condition. Invaders that replace decreaser grasses are broomsedge, annual three-awn, and poverty oatgrass.

The annual yield of herbage is about 5,000 pounds per acre in years when the amount of moisture is favorable and about 2,500 pounds in years when the amount of moisture is unfavorable.

STEEP CHERT SAVANNAH RANGE SITE

This range site consists of Bodine stony silt loam, steep, a cherty soil of the uplands. Permeability is rapid. A low moisture-holding capacity limits productivity.

When this site is in excellent condition, the vegetation consists of open stands of trees and an understory of tall grasses. Post oak, blackjack oak, red oak, and white oak grow on north- and east-facing slopes. With the exception of the red oak and white oak, these kinds of trees also grow on south- and west-facing slopes, and in addition, there are shortleaf pine. If grazing has been properly controlled, the main decreaser plants are big bluestem, little bluestem, indiangrass, slender lespedeza, and tickclover.

When this site is in poor condition, the plant cover consists of blackjack oak, post oak, sassafras, persimmon, and an abundance of such invaders as broomsedge and poverty oatgrass.

The annual yield of herbage is about 4,500 pounds per acre in years when the amount of moisture is favorable and about 2,250 pounds per acre in years when the amount of moisture is unfavorable.

Woodland [2]

About 40 percent of Sequoyah County is in forest or woodland. Heavy cutting, fires, and uncontrolled grazing have nearly eliminated high-quality trees from the forest

[2] By CHARLES P. BURKE, woodland conservationist, Soil Conservation Service.

stands. In many places the most highly productive of the woodland sites are intermingled with less productive sites and with savannah or prairie. Culls and other low-quality trees make up a high percentage of most stands. Most of the woodland is owned by farmers and ranchers. It is used mainly for grazing.

The woodland on uplands consists mainly of mixed stands of oak and hickory. An area some 15,000 acres in size in the upper part of Lee Creek watershed in the northeastern part of the county, however, supports shortleaf pine. There are a few almost pure stands (fig. 12), but most stands include many oak and hickory trees. There is some pine also on the cherty soils of the north-central part of the county. Elsewhere in the northern part of the county, single pine trees and remnants of small groves occur here and there.

Figure 12.—**An almost pure stand of shortleaf pine on an area of Hector-Linker-Enders complex, 5 to 40 percent slopes. This stand includes only a few hardwoods.**

Woodland groups

The soils of Sequoyah County that are suitable for producing wood crops have been placed in eight woodland groups. Each group consists of soils that have similar characteristics, require about the same management, and have about the same potential productivity. The soil series represented are named in the description of each site, but this does not mean that all the soils of a given series are in the site. The woodland group classification of individual soils can be learned by referring to the "Guide to Mapping Units."

Potential productivity is discussed in terms of site index, the average annual growth rate, and ratings of management problems.

The site index of a soil for specified kinds of trees was determined by using data gathered by measuring trees in well-stocked, even-aged stands. It represents the average height of the dominant trees in the stand at 50 years of age, except for cottonwoods. In cottonwood stands, it is the average height of the dominant trees at 30 years of age.

The average yearly growth rate of representative trees, in board feet per acre, according to the Doyle scale, is given in the discussion of the woodland groups. The growth figures for shortleaf pine were interpolated directly from table 122 of U.S.D.A. Miscellaneous Publication No. 50 (*6*).[3] Yield figures for southern hardwoods were adapted from table 7 of U.S.D.A. Handbook No. 181 (*3*).

The management problems discussed in each woodland group are equipment limitation, seedling mortality, plant competition, and the erosion hazard.

The use of equipment is affected by wetness, stoniness, slope, and, especially in the case of coarse-textured soils, by lack of moisture. Some of the limitations are seasonal; others are problems throughout the year. The severity of the limitation varies according to the type of equipment commonly used in planting, tending, and harvesting the wood crops. The limitation is slight if there is little or no restriction on the type of equipment that can be used or on the time of year that equipment can be used. It is moderate if the use of equipment is limited by slope or seasonal wetness. It is severe if the use of equipment is limited by slope, rocks, texture, instability of the soils, or seasonal wetness.

Seedling mortality refers to the loss of seedlings or saplings that can ordinarily be expected. It applies to both naturally regenerated seedlings and to planted stock. Mortality is rated as slight if trees regenerate naturally in areas where there is enough seed, or if not more than 25 percent of planted seedlings die. It is moderate if trees ordinarily do not regenerate in numbers that will restock the stands naturally, or that 25 to 50 percent of planted seedlings die. It is severe if trees do not reseed naturally, even where there are enough seeds, or if 50 percent or more of planted seedlings die.

Plant competition refers to invasion by undesirable species of trees or brush, which compete with desirable species for moisture and plant nutrients. It also refers to the return of such invaders after control measures have been applied. Plant competition is slight if unwanted plants do not prevent adequate natural regeneration or do not interfere with the early growth and adequate development of planted seedlings. It is moderate if unwanted plants delay natural regeneration but do not retard the eventual development of a fully stocked stand. It is severe if unwanted plants prevent adequate restocking, without intensive preparation of the site and without special maintenance practices.

Erosion damages the quality of the soils of a site, obstructs roads and trails that are necessary for access and fire protection, and interferes with harvesting. It affects the use of all kinds of equipment. The erosion hazard referred to in the discussions of the woodland groups is based on an estimate of the erosion to be expected under customary management. The erosion hazard is slight if only a small loss of soil material is likely. It is moderate if uncontrolled runoff and inadequate plant cover can be expected to result in a moderate loss of soil material. It is severe if steepness, uncontrolled runoff, and slow infiltration and permeability can be expected to result in loss of considerable soil material.

WOODLAND GROUP 1

This group consists of deep, nearly level soils of the Latanier, Lela, Miller, and Muldrow series. These soils occur on bottom lands. They are somewhat poorly drained and are very slowly permeable. They have a moderately

[3] Italicized figures in parentheses refer to Literature Cited, p. 56.

fine textured to fine textured surface layer and a fine textured subsoil.

Osage-orange is suitable for planting in post lots on these soils. The preferred kinds of trees in existing stands are water oak, bur oak, pin oak (fig. 13), Osage-orange, and ash. The site index for water oak is ordinarily 86 feet. The potential annual growth rate is 254 board feet per acre.

The use of equipment on these soils is limited during wet weather. Seedlings are damaged by wetness in prolonged wet periods and by lack of moisture in dry periods. In many places undesirable shrubs and trees interfere with the growth of desirable trees. Erosion is not a hazard.

WOODLAND GROUP 2

This group consists of deep, nearly level to undulating soils of the Cleora, Crevasse, Robinsonville, and Yahola series. These soils occur on bottom lands. They are well drained to somewhat excessively drained and are moderately to rapidly permeable. The soils are moderately coarse textured and coarse textured.

Black locust is suitable for planting in post lots on these soils. Cottonwood is the most desirable species for woodland plantings. The preferred kinds of trees in existing stands are cottonwood, sycamore, willow, and sweetgum. The site index for cottonwood is ordinarily 86 feet. The potential annual growth rate is 295 board feet per acre.

Conventional wheeled equipment cannot be used on the Crevasse soils during very dry periods. Small seedlings are damaged by extremely high soil temperature in summer. Plant competition is slight to moderate. Erosion is not a hazard.

WOODLAND GROUP 3

This group consists of deep, loamy, nearly level to undulating soils of the Brewer, Lonoke, Mason, and Razort series and the areas of Yahola complex where the subsurface layer is clay. These soils occur on bottom lands. They are well drained to moderately well drained and are moderately to slowly permeable.

Black locust and catalpa are suitable for planting in post lots on these soils. Cottonwood is suitable for woodland planting. The preferred kinds of trees in existing stands are water oak, red oak, white oak, cottonwood, and pecan. The site index is ordinarily 83 feet for water oak and 88 feet for cottonwood. The potential annual growth rate is 230 board feet per acre for water oak and 320 board feet for cottonwood.

The limitations in the use of equipment range from slight to moderate. Seedling mortality is moderately severe during extended dry spells. Plant competition from brush and weeds is a problem in establishing cottonwoods. Erosion is not a hazard.

WOODLAND GROUP 4

This group consists of deep, nearly level soils of the Ennis, Rosebloom, and Wrightsville series. These soils occur on stream terraces and flood plains and are subject to flooding in some places. They are well drained to poorly drained and moderately permeable to very slowly permeable. They have a medium-textured surface layer and a medium-textured to fine-textured subsoil.

Black locust is suitable for planting in post lots on these soils. Cottonwood is suitable for woodland planting. The native species that should be favored in management include red oak, sycamore, sweetgum, and cottonwood. The site index is ordinarily 78 feet for black oak and 80 feet for cottonwood. The potential annual growth rate is 180 board feet per acre for upland oak and 235 board feet for cottonwood.

***Figure 13.*—Young oaks on Lela clay. This is one of the few remaining areas of woodland on the soils of woodland group 1.**

The most severe limitation in the use of equipment arises from the frequent flooding of some areas of the Rosebloom soil. Seedling mortality on areas of the Rosebloom soil is likely to be moderately severe in the first growing season. Plant competition is not more than moderately severe on any of the soils of this group. Erosion is not a hazard.

WOODLAND GROUP 5

The only soil in this group is Bodine stony silt loam, steep. This is a deep, stony soil on uplands. It is somewhat excessively drained and rapidly permeable. The slope ranges from 15 to 50 percent. The surface layer is medium textured, and the subsoil is fine textured.

This soil is not suited to post-lot plantings. The steeper, very stony slopes are not suited to woodland plantings. Shortleaf pine and redcedar are suitable native trees for planting on south slopes. Red and white oaks and other upland hardwoods are suitable for planting on north slopes. The site index is ordinarily 45 feet for shortleaf pine and 47 feet for black oak. The average annual growth rate is 35 board feet per acre for shortleaf pine and for mixed oaks.

The use of equipment is very severely limited because, of the rocks and the slope. Seedling mortality is severe, except in unusually wet years. Plant competition is very severe. Undesirable trees and brush that have lower moisture requirements tend to suppress the growth of the more desirable trees. Erosion is not a severe hazard.

WOODLAND GROUP 6

This group consists of very shallow to deep, very gently sloping to steep soils of the Enders, Hector, Linker, and Sallisaw series. These soils occur on uplands. They are somewhat excessively drained to moderately well drained and moderately rapidly permeable to slowly permeable. They have a medium-textured surface layer and a moderately fine textured to fine textured subsoil. In many places they are very stony.

These soils are not suited to post-lot plantings. Shortleaf pine and eastern redcedar are suitable for woodland plantings. The preferred kinds of trees in existing stands are shortleaf pine (fig. 14), eastern redcedar, red oak, and white oak. The site index is 54 feet for shortleaf pine and 52 feet for red oak. The average annual growth rate is 85 board feet per acre for shortleaf pine and 40 board feet for mixed oak.

The use of equipment is especially difficult on the steep slopes of the Hector-Linker-Enders complex and on the Sallisaw complex. Seedling mortality is moderately severe on the steeper slopes. Plant competition is severe. Erosion is a moderate to severe hazard; control is hardest on the Hector-Linker-Enders complex, where the slope is as much as 40 percent.

WOODLAND GROUP 7

This group consists of deep, very gently sloping to gently sloping soils of the Pickwick and Sallisaw series. These soils occur on stream terraces and on uplands. They are well drained and moderately permeable. They have a medium-textured surface layer and a moderately fine textured subsoil.

Black locust is suitable for planting in post lots on these soils. Shortleaf pine and eastern redcedar are suitable for woodland plantings. Loblolly pine can be planted on the Pickwick soils. The preferred kinds of trees in existing stands are shortleaf pine, red oak, white oak, and eastern redcedar. The site index is ordinarily 55 feet for shortleaf pine and 54 feet for red oak. The average annual growth rate is 90 board feet per acre for shortleaf pine and 45 board feet per acre for mixed oak.

There are no serious equipment limitations. Seedling mortality is not a special problem, except in very dry growing seasons. Plant competition is moderate. The erosion hazard is not more than moderate.

WOODLAND GROUP 8

This group consists of deep, very gently sloping to sloping soils of the Linker, Pickwick, and Sallisaw series. These soils occur on uplands. They are moderately to severely eroded. They are well drained and moderately permeable.

These soils are not suited to post-lot plantings. Shortleaf pine and eastern redcedar are suitable for woodland plantings. The preferred kinds of trees in native stands are shortleaf pine, eastern redcedar, red oak, and white oak. The site index is ordinarily 50 feet for shortleaf pine and 46 feet for red oak. The annual growth rate is 55 board feet per acre for shortleaf pine and for mixed oaks.

The equipment limitations are slight to moderate. The management problems related to seedling mortality, plant competition, and erosion range from moderate to severe. All of these problems are related to the susceptibility of the soils to erosion.

Post lots

The trees most suitable for post lots in this county are Osage-orange, black locust, and catalpa. Suitability for post lots is given in the discussion of each woodland group.

Although soils of the Summit series and the land type Strip mines have not been assigned to a woodland group, some of these areas can be used for post lots. Some areas of the Summit soils can be used for Osage-orange if there

***Figure 14.*—A good stand of naturally regenerated seedlings of shortleaf pine on a gently sloping area of Hector-Linker-Enders complex, 5 to 40 percent slopes.**

is at least 5 feet of soil over the consolidated bedrock. These soils are not suited to black locust or catalpa. Some of the dump areas of Strip mines can be used for post lots. It is advisable to seek advice from a forester or a soil scientist before using any of these areas for post-lot plantings.

Wildlife[4]

The important kinds of wildlife in Sequoyah County are bobwhite quail, mourning dove, fox squirrel, gray squirrel, cottontail rabbit, deer, raccoon, mink, opossum, skunk, muskrat, and beaver. The predatory mammals are coyote, bobcat, red fox, and gray fox. The predatory birds are hawks and owls. Songbirds are common. Great numbers of waterfowl and shore birds use the large lakes as resting places while migrating.

The suitability of the soils for wildlife habitat can be related in a general way to the seven soil associations in this county. The associations are described more fully in the section "General Soil Map."

The Hector-Linker-Enders association supports a woody vegetative cover, predominantly oak but including small amounts of pine and hickory. An understory of native grasses grows throughout the association. Where competition from trees is not serious, most of the areas support shrubs, grasses, and forbs that make desirable wildlife habitat. Only small, nonstony areas are suitable for supplemental planting for wildlife food and cover. The association provides a habitat for moderate numbers of deer, squirrel, and turkey because of the presence of mast trees. It supports only small numbers of cottontail rabbits, quail, and dove, because little or none of the association is cultivated and the grass, forbs, and low, shrubby cover are too sparse. The Linker and Enders soils support large mast and den trees, which provide desirable habitat for squirrel. Farm ponds can support moderate numbers of fish. Turbidity is not a problem, and rainfall is generally sufficient to maintain the water level.

The Linker-Pickwick-Stigler association is moderately well suited to wildlife habitat. Supplemental plantings for all kinds of wildlife can be made on the tillable soils,

[4] By JEROME SYKORA, biologist, Soil Conservation Service.

but the potential is highest for quail, cottontail rabbits, and dove. The potential for squirrel is low because large mast and den trees are generally lacking. A few large trees that are suitable for squirrel habitat grow along the larger streams and drainageways. The potential for deer and turkey is low because desirable cover is lacking. The potential for production of fish is high. Sites suitable for ponds are numerous, and turbidity is not a significant problem.

The Stigler-Vian-Spiro association supports prairie vegetation. The soils are moderately well suited to supplemental plantings for wildlife. The potential for habitat suitable for deer, squirrel, and turkey is low because these soils cannot support enough woodland. The potential for habitat suitable for quail and cottontail rabbits is high. The prairie drainageways generally support many kinds of forbs, shrubs, and trees, which occur as small clumps and strips within larger areas of native grasses. The potential for production of fish in farm ponds is good. Sites suitable for ponds are available, and turbidity is not a serious problem. Trenches excavated by strip mining, mainly in areas of Stigler and Vian soils, are filled with water and have a moderate potential for production of fish.

The Yahola-Lonoke-Brewer association is composed of deep, fertile, alluvial soils that have a high potential for production of all kinds of vegetation needed by wildlife. It is moderately well suited to deer, turkey, dove, cottontail rabbits, furbearers, and waterfowl. The potential for habitat for quail is low because most areas of protective cover are on the somewhat poorly drained Lela soils. The Yahola and Crevasse soils are subject to flooding, and their potential is somewhat lower than that of the other soils in this association. The potential for production of fish in farm ponds is low because suitable sites are lacking and there is an overflow hazard. The potential for production of many kinds of fish in the Arkansas River is moderate.

The Rosebloom-Mason association has a moderate to high potential for wildlife habitat. The soils occur as narrow bands paralleling the creeks, and frequent flooding and poor drainage limit production on some 45 percent of the acreage. Overflow causes some problems on about 20 percent of the acreage. The potential for deer, turkey, dove, cottontail rabbits, waterfowl, and furbearers is high. The possibilities for suitable habitat are increased by the diversity of plant communities on soils adjoining this association. The potential for quail is low to moderate on these soils because they are flooded occasionally, and because the Rosebloom soils are poorly drained. This association is generally suitable for construction of fish ponds.

The Bodine association supports oak-hickory woodland and a sparse ground cover of grass. It is moderately well suited as habitat for deer, turkey, squirrel, and furbearers because of the predominance of mast trees and shrubs. It is poorly suited as habitat for quail, cottontail rabbits, dove, and waterfowl. Stoniness and the slope hinder cultivation for supplemental planting and severely limit the number of sites suitable for construction of fish ponds.

The Sogn-Summit association is moderately well suited as wildlife habitat. The potential for deer, quail, dove, cottontail rabbits, turkey, and furbearers is only moderate because stands of grass, forbs, and woody plants are sparse and scattered. Fish ponds can be constructed on these soils, and the potential for fish production is moderate. The Summit soils are suitable for supplemental plantings.

Engineering Uses of the Soils[5]

Some soil properties are of special interest to engineers because they affect the construction and maintenance of roads, airports, pipelines, building foundations, facilities for water storage, erosion control structures, drainage systems, and sewage disposal systems. Among the properties most important to engineers are permeability, shear strength, compaction characteristics, drainage, shrink-swell characteristics, grain size, plasticity, and pH. Also important are topography and the depth to the water table and to bedrock.

Information in this soil survey can be used to—

1. Make studies that will aid in selecting and developing sites for industrial, business, residential, and recreational uses.
2. Develop information that can be used in planning drainage systems, farm ponds, irrigation systems, field terraces, and diversion terraces.
3. Make preliminary evaluations that will aid in selecting locations for highways, airports, pipelines, and cables, and in planning detailed investigations of the soils at the selected locations.
4. Locate probable sources of gravel and other construction material.
5. Correlate performance of engineering structures with soil mapping units to develop information that can be useful in designing and maintaining such structures.
6. Determine the suitability of soils for cross-country movement of vehicles and construction equipment.
7. Supplement information obtained from published maps, reports, and aerial photographs for the purpose of making maps and reports that can be used readily by engineers.
8. Develop other preliminary estimates for construction purposes pertinent to a particular area.

With the use of the soil map for identification, the engineering interpretations reported here can be useful for many purposes. It should be emphasized that they do not eliminate the need for sampling and testing at the site of specific engineering works involving heavy loads or excavations deeper than the depths of layers here reported. Even in these situations, the soil map is useful for planning more detailed field investigations and for suggesting the kinds of problems that may be expected.

Much of the information in this section is presented in tables. Only the data in table 3 are from actual laboratory tests. The estimates in table 4 and the interpretations in table 5 are based on comparisons of soils with those tested. At many construction sites, major variations in soil characteristics occur within the depth of the proposed excavation, and several kinds of soil occur within short distances. Specific laboratory data on engineering properties of the soil at the site should be obtained before planning detailed engineering work.

[5] By F. E. McClung, agricultural engineer, and William E. Hardesty, civil engineer, Soil Conservation Service.

Some of the terms used in this publication have a special meaning to soil scientists and a different meaning to engineers. The Glossary defines many such terms as they are used in soil science.

Engineering classification systems

Two systems of classifying soils for engineering purposes are in general use. Classification of the soils of Sequoyah County according to both of these systems is given in this survey.

The system used by the American Association of State Highway Officials (AASHO) (*1*) is based on field performance of soils in highways. In this system, soil materials are classified into seven principal groups, designated A–1 through A–7. The best materials for use in highway subgrades (gravelly soils of high bearing capacity) are classified as A–1, and the poorest (clayey soils having low strength when wet) are classified A–7. The relative engineering value of the soils within each group is indicated by a group index number. Group indexes range from 0 for the best material to 20 for the poorest.

The Unified system of soil classification was developed by the Waterways Experiment Station, Corps of Engineers (*8*). In this system, soil materials are identified as coarse grained (G or S), fine grained (M or C), and highly organic (O), and symbols are used to identify each group. For example, soils that consist primarily of fine-grained material, either plastic or nonplastic, are identified by the symbols ML or CL if the liquid limit is low and by MH or CH if the liquid limit is high.

The U.S. Department of Agriculture system of classifying soils according to texture is primarily for agricultural use, but the textural classification is useful in engineering also. In this system, soils are classified according to the proportional amounts of different sizes of mineral particles. A soil that is 40 percent clay particles, for example, is called clay. Beginning with the largest, the particle sizes are designated as cobblestones, gravel, sand, silt, and clay. Rarely does a soil consist of particles of only one size, but in many places particles of one size are dominant. Soil texture is a characteristic closely associated with workability, fertility, permeability, erodibility, and other important soil characteristics.

Test data

Table 3 gives test data for samples of eight of the soil series of the county. Selected layers of the soils were sampled, and the samples were tested by the Oklahoma Department of Highways according to standard procedures. The samples tested were taken from profiles considered modal for the series. They do not represent all of the soils of Sequoyah County, or even the maximum range of characteristics of each series sampled.

Estimated properties

In table 4 the soil series of the county and their mapping symbols are listed and certain properties significant in engineering are described. Table 4 does not show depth to bedrock hard enough to require blasting or drilling for economic removal. Depth to bedrock is more than 5 feet for soils of all series except those following: Collinsville series, bedrock 4 to 12 inches from the surface; Hector, 8 to 20 inches; Linker, 20 to 48 inches; Pickwick, 48 to 84 inches; Sogn, 4 to 12 inches; Spiro, 20 to 48 inches; Enders, 30 to 55 inches; Stigler, 48 to 240 inches; Lafe, 40 to 84 inches.

Permeability, as used in the table, refers only to the downward movement of water through undisturbed soil material. The estimates are based on structure and porosity of the soil as it occurs in place. Such features as plowpans and surface crusts were not considered.

The available water capacity, given in terms of inches per inch of soil, is the approximate amount of capillary water in the soil when it is wet to field capacity. When the amount of moisture in the soil is at the wilting point of plants, the amount of water shown in the table will wet the soil material described to a depth of 1 inch without further percolation.

The shrink-swell potential indicates the change in volume to be expected when the moisture content changes. It is estimated primarily on the basis of the amount and kind of clay in a soil.

Table 4 also shows the hydrologic soil group for each of the series represented in Sequoyah County. These groupings are based on intake of water at the end of long-duration storms, after prior wetting and opportunity for swelling, without consideration of slope or the effect of vegetation. There are four hydrologic groups:

GROUP A consists of soils that have a high infiltration rate even when thoroughly wetted, chiefly deep, well-drained to excessively drained sand, gravel, or both. These soils have a high rate of water transmission and a low runoff potential.

GROUP B consists of soils that have a moderate infiltration rate when thoroughly wetted and that are chiefly moderately deep to deep, moderately well drained to well drained, and moderately fine textured to moderately coarse textured. These soils have a moderate rate of water transmission.

GROUP C consists of soils that have a slow rate of infiltration when thoroughly wetted, chiefly soils that have a layer that impedes downward movement of water and soils that are moderately fine textured to fine textured. These soils have a slow rate of transmission.

GROUP D consists of soils that have a very slow rate of infiltration when thoroughly wetted, chiefly clay soils that have a high swelling potential, soils that have a permanently high water table, soils that have a claypan or clay layer at or near the surface, and soils shallow over nearly impervious materials. These soils have a very slow rate of water transmission.

Engineering interpretations

Table 5 gives engineering interpretations of the soils and estimates of their suitability for engineering uses. The data apply to the soil considered representative of the series. A detailed profile typical of each series is described in the section "Descriptions of the Soils." Some soil features are favorable for certain kinds of engineering work but unfavorable for others. Among the soil features for which suitability ratings are given are the following:

TOPSOIL. The suitability of a soil as a source of topsoil depends largely on texture and depth. It is necessary that the topsoil be of a texture that works to a good seedbed yet contains enough clay to resist erosion on strong slopes. The depth of suitable material determines whether or not it is economical to use the soil as a source of topsoil.

TABLE 3.—*Engineering*

[Tests performed by the Oklahoma Department of Highways in accordance with standard

Soil name and location	Parent material	Oklahoma report No. SO-	Depth from surface	Shrinkage		Volume change
				Limit	Ratio	
			Inches	*Percent*		*Percent*
Crevasse soils:						
2,000 feet S. and 100 feet E. of NW. corner of sec. 15, T. 10 N., R 26 E. (modal).	Alluvium.	5060	0–11	(3)	(3)	(3)
		5061	11–40	(3)	(3)	(3)
Enders soil in Hector-Linker-Enders complex:						
1,700 feet N. and 1,150 feet W. of SE. corner of sec. 29, T. 13 N., R. 24 E. (modal).	Shale.	5054	0–2	(3)	(3)	(3)
		5055	4–12	18	1. 74	66
		5056	20–40	19	1. 73	67
Mason silt loam:						
2,430 feet E. and 300 feet N. of SW. corner of sec. 34, T. 12 N., R. 23 E. (modal).	Alluvium.	5033	0–12	20	1. 68	6
		5034	12–41	14	1. 86	18
		5035	41–65	14	1. 88	22
Muldrow silty clay loam:						
200 feet N. and 100 feet E. of SW. corner of sec. 21, T. 11 N., R. 27 E. (modal).	Alluvium.	5051	6–18	15	1. 87	32
		5052	18–42	11	1. 99	46
		5053	42–68	10	2. 03	67
Rosebloom silt loam:						
1,550 feet E. and 100 feet S. of NW. corner of sec. 11, T. 11 N., R. 23 E. (modal).	Alluvium.	5036	0–10	22	1. 64	11
		5037	10–24	18	1. 76	8
		5038	24–60	16	1. 85	23
Sallisaw loam:						
2,420 feet W. of SE. corner of sec. 10, T. 11 N., R. 23 E. (modal).	Alluvium.	5042	0–12	(3)	(3)	(3)
		5043	20–36	22	1. 67	17
		5044	36–48	14	1. 92	42
Stigler silt loam:						
1,900 feet N. and 650 feet E. of SW. corner of sec. 11, T. 11 N., R. 24 E. (modal).	Shale, alluvium, or loess.	5045	0– 9	14	1. 89	37
		5046	24–38	14	1. 90	55
		5047	50–62	12	1. 97	53
Vian silt loam:						
1,750 feet S. and 100 feet W. of NE. corner of NW¼ sec. 18, T. 11 N., R. 24 E. (modal).	Alluvium or loess.	5039	0–10	(3)	(3)	(3)
		5040	26–38	15	1. 86	41
		5041	48–62	12	1. 91	39

[1] Analysis according to AASHO Designation: T 88–57 (*1*). Results by this procedure frequently differ somewhat from results obtained by the soil survey procedure of the Soil Conservation Service (SCS). In the AASHO procedure, the fine material is analyzed by the hydrometer method, and the various grain-size fractions are calculated on the basis of all the material, including that coarser than 2 millimeters in diameter. In the SCS soil survey procedure, the fine material is analyzed by the pipette method, and the material coarser than 2 millimeters in diameter is excluded from calculations of grain-size fractions. The mechanical analysis data used in this table are not suitable for use in naming textural classes for soil.

test data

procedures of the American Association of State Highway Officials (AASHO)]

Mechanical analysis data [1]						Liquid limit	Plasticity index	Classification	
Percentage passing sieve—			Percentage smaller than—					AASHO	Unified [2]
No. 10 (2.0 mm.)	No. 40 (0.42 mm.)	No. 200 (0.074 mm.)	0.05 mm.	0.005 mm.	0.002 mm.				
						Percent			
100	91	6	3	2	1	(3)	(3)	A-3(0)	SP-SM
100	98	3	2	2	1	(3)	(3)	A-3(0)	SP
[4] 92	86	69	44	12	7	(3)	(3)	A-4(7)	ML
100	99	97	93	78	71	76	34	A-7-5(20)	MH
100	99	97	93	80	69	90	48	A-7-5(20)	MH
----------	100	84	73	18	10	27	5	A-4(8)	ML-CL
----------	100	92	82	32	24	31	12	A-6(9)	CL
----------	100	96	88	37	28	35	16	A-6(10)	CL
----------	100	98	93	37	28	44	21	A-7-6(13)	CL
----------	100	98	93	46	37	52	30	A-7-6(18)	CH
----------	100	98	93	55	45	62	37	A-7-6(20)	CH
100	97	93	86	22	13	32	6	A-4(8)	ML
100	96	93	87	26	18	27	6	A-4(8)	ML-CL
100	96	94	88	37	28	38	17	A-6(11)	CL
[4] 94	92	69	50	11	7	(3)	(3)	A-4(7)	ML
100	99	77	63	32	28	35	6	A-4(8)	ML
[5] 27	25	18	15	9	8	39	17	A-2-6(0)	GC
100	99	95	87	26	18	35	12	A-6(9)	ML-CL
----------	100	98	93	59	50	59	32	A-7-6(20)	CH
100	99	96	92	59	45	53	28	A-7-6(18)	CH
100	99	85	70	8	5	(3)	(3)	A-4(8)	ML
100	99	89	77	33	29	41	19	A-7-6(12)	CL
100	99	90	86	39	26	55	35	A-7-6(19)	CH

[2] Soil Conservation Service and Bureau of Public Roads have agreed to consider that all soils having plasticity indexes within two points of the A-line are to be given a borderline classification. An example of a borderline classification so obtained is ML-CL.

[3] Nonplastic.

[4] 100 percent passed the ¾-inch sieve; 96 percent passed the No. 4 sieve.

[5] 72 percent passed the ¾-inch sieve; 32 percent passed the No. 4 sieve.

TABLE 4.—*Estimated*

[Estimated properties of soils mapped as complexes or as undifferentiated units are given under the series name of the individual

Soil series and map symbols	Hydrologic soil group	Permeability of least permeable layer	Depth from surface	Classification: USDA texture	Classification: Unified	Classification: AASHO
		Inches per hour	*Inches*			
Bodine: BsF	A	5.00–10.00	0–20	Stony silt loam	GP	A–1
			20–55	Chert	GP	A–2
Brewer: Bw	D	0.05–0.20	0–11	Silt loam	ML	A–4
			11–65	Silty clay loam	CL, CH	A–6, A–7
Cleora: Ce	B	2.50–5.00	0–65	Fine sandy loam	SM, ML	A–2, A–4
Collinsville: CnE	C	2.50–5.00	0–7	Fine sandy loam	ML	A–4
			7–20	Sandstone.		
Crevasse: Cr	A	5.00–10.00	0–10	Loamy fine sand	SP–SM	A–2, A–3
			10–70	Fine sand	SP	A–3
Enders	C	0.05–0.20	0–7	Fine sandy loam	ML	A–4
			7–40	Clay	CL, CH	A–7
			40–70	Shale.		
Ennis	B	0.80–2.50	0–65	Silt loam	ML–CL	A–4, A–6
Hector: HeF (For Linker part, see Linker series. For Enders part, see Enders series.)	D	5.00–10.00	0–10	Fine sandy loam	ML	A–4
			10–20	Sandstone.		
Lafe: La	D	<0.05	0–7	Silt loam	ML	A–4
			7–55	Clay	CL–CH	A–7
			55–60	Shale.		
Latanier: Lc	D	<0.05	0–17	Clay	CH, MH	A–7
			17–23	Silty clay loam	ML, CL	A–6
			23–70	Very fine sandy loam or loamy very fine sand.	ML, CL, SM	A–4
Lela: Lm	D	<0.05	0–70	Silty clay	CH, MH	A–7
Linker: LnC, LnD, LoD3 (For Hector part of LnC and LnD, see Hector series. For Stigler part of LoD3, see Stigler series.)	B	0.80–2.50	0–12	Loam	ML, CL	A–4
			12–26	Clay loam	ML–CL	A–4, A–6
			26	Sandstone.		
Lonoke:						
LrA	B	0.80–2.50	0–24	Loam	ML–CL	A–4
			24–50	Very fine sandy loam	ML	A–4
			50–70	Fine sand	SP–SM	A–3
LsA, LsB	B	0.20–0.80	0–18	Silty clay loam	ML–CL	A–4, A–6
			18–70	Very fine sandy loam	ML	A–4
Mason: Ma	B	0.20–0.80	0–11	Silt loam	ML, CL	A–4
			11–80	Silty clay loam	CL	A–6
McKamie: MkE	D	0.05–0.20	0–7	Loam	ML, CL	A–4
			7–70	Clay	CL–CH	A–7
Miller:						
Mr	D	<0.05	0–50	Clay	MH, CH	A–7
			50–70	Very fine sand or fine sand.	SP–SM	A–3
Ms	D	<0.05	0–12	Silty clay loam	ML–CL	A–4, A–6
			12–52	Silty clay	CH–MH	A–7
			52–65	Very fine sandy loam	ML	A–4
Muldrow: Mu	D	<0.05	0–23	Silty clay loam	CL	A–7
			23–72	Silty clay	CH	A–7

properties

components. The Strip mines land type is not listed in the table, because the properties are too variable for reliable evaluation]

Percentage passing sieve—			Available water capacity	Reaction	Shrink-swell potential	Corrosivity	
No. 4 (4.7 mm.)	No. 10 (2.0 mm.)	No. 200 (0.074 mm.)				Uncoated steel	Concrete
			Inches per inch of soil	*pH*			
18–25	15–25	10–20	0.05	4.8–6.2	Low	Low	High.
10–20	5–15	1–10	.05	4.5–5.5	Low	Moderate	High.
100	100	85–95	.14	6.1–7.0	Low	Moderate	Low.
100	100	85–95	.17	6.1–7.3	Moderate	Moderate	Low.
100	100	30–60	.14	5.6–6.5	Low	Low	Moderate.
100	100	60–80	.14	5.1–6.5	Low	Low	Moderate.
100	100	5–35	.09	7.4–8.4	Low	Low	Low.
100	90–100	3–10	.07	7.4–8.4	Low	Low	Low.
70–80	70–80	60–80	.14	5.5–6.3	Low	Low	Moderate.
70–80	70–80	55–98	.17	4.5–5.5	High	Moderate	High.
100	100	75–90	.14	4.5–6.0	Low	Moderate	High.
70–80	70–80	60–80	.14	4.5–6.0	Low	Moderate	High.
100	100	75–90	.14	5.1–7.0	Low	High	High.
100	100	75–95	.17	7.0–9.0	High	High	High.
100	100	90–98	.17	6.6–8.4	High	High	Moderate.
100	100	85–95	.17	6.6–8.4	Moderate	High	Moderate.
100	100	45–60	.14	6.6–8.4	Low	Moderate	Low.
100	100	90–98	.17	6.1–7.8	High	High	Moderate.
100	100	55–85	.14	5.1–6.5	Low	Low	Moderate.
100	100	75–95	.17	4.5–5.5	Moderate	Moderate	Low.
100	100	55–85	.14	5.6–7.3	Low	Low	Moderate.
100	100	60–80	.14	6.1–7.8	Low	Low	Low.
100	100	5–10	.05	6.1–7.8	Low	Low	Low.
100	100	85–95	.17	6.1–7.8	Moderate	Moderate	Low.
100	100	60–80	.14	6.1–7.8	Low	Low	Low.
100	100	75–90	.14	6.0–6.8	Low	Moderate	Low.
100	100	85–98	.17	5.6–6.5	Moderate	Moderate	Moderate.
100	100	55–85	.14	4.5–6.5	Low	Moderate	High.
100	100	90–98	.17	5.1–8.4	High	High	High.
100	100	90–98	.17	6.6–8.4	High	High	Moderate.
100	100	5–10	.05	6.6–8.4	Low	Moderate	Low.
100	100	85–95	.17	6.6–8.4	Moderate	High	Moderate.
100	100	90–98	.17	7.4–8.4	High	High	Moderate.
100	100	60–80	.14	6.6–8.4	Low	Moderate	Low
100	100	85–98	.17	6.1–7.0	Moderate to high	High	Low
100	100	90–98	.17	6.1–8.0	High	High	Low.

TABLE 4.—*Estimated*

Soil series and map symbols	Hydrologic soil group	Permeability of least permeable layer	Depth from surface	Classification		
				USDA texture	Unified	AASHO
		Inches per hour	*Inches*			
Pickwick: PcB, PcC PcC2	B	0.80–2.50	0–10	Loam	ML, CL	A–4
			10–68	Clay loam	ML–CL	A–6, A–7
			68	Sandstone.		
Razort: Ra	B	0.80–2.50	0–11	Fine sandy loam	SM, ML	A–2, A–4
			11–70	Sandy clay loam	SC, CL	A–4
Robinsonville: RoA, RoB	B	2.50–5.00	0–50	Fine sandy loam	SM, ML	A–2, A–4
			50–70	Loamy fine sand	SM	A–2
Rosebloom: Rs, Rt, Ru (For Ennis part of Ru, see Ennis series.)	D	<0.05	0–10	Silt loam	ML	A–4
			10–60	Silty clay loam	ML–CL	A–4, A–6
Sallisaw: SaF, SlB, SlC, SlC2	B	0.80–2.50	0–17	Loam	ML	A–4
			17–36	Clay loam	ML or CL	A–6, A–7
			36–70	Gravelly clay loam	GC	A–2
Sogn: SmF	D	0.20–0.80	0–7	Silty clay loam	ML	A–4, A–6
			7–31	Limestone.		
Spiro: SnC	B	0.80–2.50	0–12	Silt loam	ML	A–4
			12–24	Silty clay loam	ML–CL	A–4, A–6
			24–36	Sandstone.		
Stigler: SoA, SrA, SrB, SrC2 (For Wrightsville part of SoA, see Wrightsville series.)	C	<0.05	0–18	Silt loam	ML	A–4,
			18–67	Silty clay loam	CH	A–7, A–6
			67–74	Shale.		
Summit: SuB, SuC	C	0.05–0.20	0–18	Silty clay loam	ML–CL	A–4, A–6
			18–50	Silty clay	CL–CH	A–7
			50–72	Silty clay loam	ML–CL	A–4, A–6
Vian: VaB, VaC	B	0.20–0.80	0–26	Silt loam	ML	A–4
			26–72	Silty clay loam	CH, CL	A–7, A–6
Wrightsville	D	<0.05	0–14	Silt loam	ML	A–4
			14–25	Silty clay	CH, MH	A–7
			25–60	Silty clay loam	ML–CL	A–4, A–6
Yahola:						
Ya	B	2.50–5.00	0–76	Fine sandy loam	SM, ML	A–2, A–4
Yh	C	<0.05–0.80	0–38	Fine sandy loam	SM, ML	A–2, A–4
			38–65	Clay	CL–CH	A–7
			65–70	Fine sandy loam	SM, ML	A–2, A–4

properties—Continued

Percentage passing sieve— No. 4 (4.7 mm.)	No. 10 (2.0 mm.)	No. 200 (0.074 mm.)	Available water capacity	Reaction	Shrink-swell potential	Corrosivity: Uncoated steel	Corrosivity: Concrete
			Inches per inch of soil	*pH*			
100	100	55–85	0.14	4.8–6.5	Low	Moderate	High.
100	100	75–95	.17	4.5–5.5	Moderate	Moderate	High.
95–100	95–100	30–60	.14	5.6–6.5	Low	Low	Moderate.
95–100	95–100	40–60	.14	5.6–6.5	Low	Low	Moderate.
100	100	30–60	.14	5.6–7.0	Low	Low	Moderate.
100	90–100	15–35	.07	5.6–7.0	Low	Low	Moderate.
100	100	85–95	.14	4.5–6.0	Low	High	High.
100	100	85–95	.17	4.5–5.5	Moderate	High	High.
100	100	50–85	.14	5.6–6.5	Low	Low	Moderate.
85–95	85–95	60–90	.17	4.5–6.0	Moderate	Moderate	High.
20–30	20–30	15–30	.17	4.5–6.0	Low	Moderate	High.
65–85	65–85	65–85	.17	7.0–8.4	Moderate	Moderate	Low.
100	100	75–90	.14	5.1–6.5	Low	Low	Moderate.
100	100	85–95	.17	4.5–5.5	Moderate	Moderate	High.
100	100	75–90	.14	4.5–6.0	Low	High	High.
100	100	85–98	.17	4.5–7.3	Moderate	High	High.
100	100	85–95	.17	6.1–7.3	Moderate	Moderate	Low.
100	100	90–98	.17	6.1–7.3	High	Moderate	Low.
100	100	85–95	.17	6.6–8.4	Moderate	Moderate	Low.
100	100	75–90	.14	4.5–6.0	Low	Moderate	High.
100	100	85–95	.17	4.5–5.5	Moderate	Moderate	High.
100	100	75–90	.14	4.5–6.0	Low	High	High.
100	100	90–98	.17	4.5–5.5	High	High	High.
100	100	85–95	.17	4.5–5.5	Moderate	High	High.
100	100	30–60	.14	7.4–8.4	Low	Low	Low.
100	100	30–60	.14	7.4–8.4	Low	Low	Low.
100	100	90–98	.17	7.4–8.4	High	High	Low.
100	100	30–60	.14	7.4–8.4	Low	Low	Low.

TABLE 5.—*Engineering*

[Interpretations were not made for miscellaneous land types,

Soil series and map symbols	Suitability as a source of—			Highway location
	Topsoil	Select grading material	Subgrade	
Bodine: BsF	Unsuitable: too stony	Unsuitable: too stony	Poor: lacks fines	Steep; stony
Brewer: Bw	Fair	Poor: too elastic	Poor: careful moisture control needed; unstable when wet.	Subsoil unstable when wet; nearly level.
Cleora: Ce	Poor: easily eroded	Good	Good	Subject to flooding
Collinsville: CnE	Poor: stony; thin surface layer.	Poor: stony	Poor: limited quantity of material over sandstone.	Broken topography; sandstone at a depth of about 1 foot.
Crevasse: Cr	Poor: too sandy	Fair: needs binder	Good	Subject to flooding
Enders	Poor: stony on surface.	Poor: limited quantity; stony.	Poor: limited quantity.	Steep slopes; narrow ridges.
Ennis	Fair	Fair	Fair	Frequently flooded
Hector: HeF (For Linker part, see Linker series. For Enders part, see Enders series.)	Poor: stony; thin surface layer.	Poor: limited quantity; stony.	Poor: limited quantity.	Steep; stony
Lafe: La	Unsuitable: easily eroded.	Unsuitable: unstable	Unsuitable	Unstable
Latanier: Lc	Poor: too clayey	Poor: too clayey	Good to poor, depending on site.	Features favorable
Lela: Lm	Poor: too clayey	Unsuitable: too clayey.	Poor: too clayey	Nearly level; unstable when wet; somewhat poorly drained.
Linker: LnC, LnD, LoD3 (For Hector part of LnC and LnD, see Hector series. For Stigler part of LoD3, see Stigler series.)	Fair: easily eroded	Fair	Fair	Sandstone bedrock at a depth of 2 to 4 feet.
Lonoke: LrA, LsA, LsB	Fair	Poor: variable material.	Good to poor, depending on site.	Seldom flooded
Mason: Ma	Good	Unsuitable: too elastic and clayey.	Poor: unstable	Unstable subsoil
McKamie: MkE	Poor: thin surface layer.	Poor: clay at a depth of less than 1 foot.	Poor: limited quantity.	Broken topography; clay subsoil.
Miller: Mr, Ms	Poor: too clayey	Poor: too clayey	Poor: too clayey	Subsoil is unstable clay; somewhat poorly drained; subject to flooding.

interpretations

because the soil material is too variable for reliable evaluation]

Farm ponds: Reservoir area	Farm ponds: Embankment	Agricultural drainage	Irrigation	Terraces and diversions	Waterways
Steep; stony; high seepage potential.	Stony material; high seepage potential.	Not applicable	Not applicable	Not applicable	Not applicable.
Features favorable	Features favorable	Not applicable	Features favorable	Not applicable	Not applicable.
High seepage potential.	High seepage potential; easily eroded.	Occasionally flooded	Occasionally flooded	Nearly level	Nearly level.
Broken topography; sandstone or shale at a depth of about 1 foot.	Limited quantity of material; rocky.	Not applicable	Not applicable	Not applicable	Not applicable.
Excessive seepage	High seepage potential; easily eroded.	Frequently flooded	High intake rate; frequently flooded.	Not applicable	Not applicable.
Steep; shale at a depth of about 3 feet.	Limited quantity of material.	Not applicable	Not applicable	Not applicable	Not applicable.
Frequently flooded; may seep.	Frequently flooded	Frequently flooded	Frequently flooded	Not applicable	Not applicable.
Sandstone at a depth of about 1 foot.	Steep; limited quantity of material.	Not applicable	Not applicable	Not applicable	Not applicable.
Features favorable	Dispersed material unstable.	Not applicable	Not applicable	Slick spots unstable; droughty.	Slick spots unstable; droughty.
Seepage potential	Features favorable for homogeneous fill.	Depressed areas need drainage.	Slow intake rate	Not applicable	Not applicable.
Features favorable	Unstable when wet	Nearly level; very slow permeability; seldom flooded.	Very slow intake rate; somewhat poorly drained.	Not applicable	Not applicable.
Sandstone bedrock at a depth of about 2 to 4 feet.	Limited quantity of material.	Not applicable	Limited root zone	Features favorable	Features favorable.
Seepage potential	Features favorable for homogeneous fill.	Seldom flooded; depressed areas need drainage.	Seldom flooded	Not applicable	Not applicable.
Features favorable	Features favorable	Seldom flooded	Seldom flooded	Nearly level	Nearly level.
Features favorable	Unstable when wet	Not applicable	Not applicable	Not applicable	Not applicable.
Features favorable; may seep at a depth of more than 4 feet.	Unstable when wet	Nearly level; very slow permeability; seldom flooded.	Very slow intake rate; seldom flooded; somewhat poorly drained.	Not applicable	Not applicable.

TABLE 5.—*Engineering*

Soil series and map symbols	Suitability as a source of—			Highway location
	Topsoil	Select grading material	Subgrade	
Muldrow: Mu	Fair	Poor: too clayey	Poor: too clayey	Unstable clay subsoil; somewhat poorly drained; subject to flooding.
Pickwick: PcB, PcC, PcC2	Good to fair	Fair	Fair	Features favorable
Razort: Ra	Poor: easily eroded	Good	Good	Subject to flooding
Robinsonville: RoA, RoB	Poor: easily eroded	Fair to good	Good	Subject to flooding
Rosebloom: Rs, Rt, Ru (For Ennis part of Ru, see Ennis series.)	Poor: easily eroded; seasonally wet.	Unsuitable: elastic and too clayey.	Poor: careful moisture control needed; unstable when wet.	Nearly level; unstable when wet; poorly drained.
Sallisaw: SaF, SlB, SlC, SlC2	Fair	Fair	Poor: unstable when wet.	Features favorable
Sogn: SmF	Unsuitable: stony	Unsuitable: stony	Poor: stony	Limestone at a depth of 1 foot; rough, broken topography.
Spiro: SnC	Poor to fair: sloping areas easily eroded.	Poor: unstable when wet; too elastic.	Poor: limited quantity.	Sandstone or shale at a depth of 2 to 4 feet.
Stigler: SoA, SrA, SrB, SrC2 (For Wrightsville part of SoA, see Wrightsville series.)	Poor to fair: easily eroded.	Poor: too elastic	Poor: too elastic when wet.	Subsoil is unstable clay; somewhat poorly drained.
Summit: SuB, SuC	Fair	Unsuitable: too clayey.	Poor: too clayey	Subsoil is clayey and unstable.
Vian: VaB, VaC	Poor to fair: easily eroded.	Poor: unstable when wet; too elastic.	Poor: unstable when wet.	Features favorable
Wrightsville	Good to fair	Fair to poor	Poor: too elastic when wet.	Poorly drained; subsoil is unstable clay.
Yahola: Ya, Yh	Poor: easily eroded	Good	Good	Subject to flooding

interpretations—Continued

Farm ponds		Agricultural drainage	Irrigation	Terraces and diversions	Waterways
Reservoir area	Embankment				
Features favorable	Unstable when wet	Nearly level; very slow permeability; seldom flooded.	Very slow intake rate; somewhat poorly drained; seldom flooded.	Not applicable	Not applicable.
Features favorable	Features favorable	Not applicable	Features favorable; slopes are 1 to 5 percent.	Features favorable	Features favorable.
Features favorable	Features favorable	Seldom flooded	Seldom flooded	Nearly level	Nearly level.
Features favorable	Seepage potential; easily eroded.	Seldom flooded	Seldom flooded	Nearly level	Nearly level.
Features favorable	Easily eroded	Nearly level; very slow permeability; occasionally to frequently flooded.	Poorly drained; very slow intake rate; occasionally to frequently flooded.	Not applicable	Not applicable.
Seepage potential below a depth of 3 feet.	Features favorable	Not applicable	Features favorable; slopes are 1 to 5 percent.	Features favorable	Features favorable.
Rock at a depth of 1 foot.	Limited quantity of material.	Not applicable	Not applicable	Not applicable	Not applicable.
Sandstone or shale at a depth of 2 to 4 feet.	Limited quantity of material.	Not applicable	Limited root zone	Features favorable	Features favorable.
Features favorable	Features favorable	Mounded topography; wet areas between mounds.	Very slow intake rate; mounded topography.	Mounded topography.	Mounded topography.
Features favorable	Features favorable	Not applicable	Slow intake rate; slopes of 1 to 5 percent.	Features favorable	Features favorable.
Features favorable	Features favorable	Not applicable	Features favorable; slopes of 1 to 5 percent.	Mounded topography.	Mounded topography.
Features favorable	Features favorable	Not applicable	Slow intake rate	Features favorable	Features favorable.
Seepage potential	Seepage potential	Occasionally flooded	Occasionally flooded	Not applicable	Not applicable.

SELECT GRADING MATERIAL. The suitability of a soil as a source of select grading material depends primarily on the grain size and the amount of silt and clay. Soils that are primarily sand are good if a binder is added for cohesion. Soils that are primarily clay compress under load and rebound when unloaded and are, therefore, rated unsuitable.

SUBGRADE. All kinds of soil material are used as road fill. Some kinds, such as sandy clay and sandy clay loam, present few problems in placement or compaction. Other kinds, such as clayey soils that have a high shrink-swell potential, require special compaction techniques and close moisture control, both during and after construction. Soils classified as sand are easy to compact but difficult to confine in a fill. The ratings of the soils as a source of subgrade reflect the ease or difficulty of overcoming these problems.

Nonfarm Uses of the Soils

In table 6, p. 50, the soils of county are rated for several nonfarm uses. The terms slight, moderate, severe, and very severe express the degrees of difficulty to be expected in overcoming the limitations. The rating is slight if there are no serious limitations. It is moderate if the difficulty needs to be recognized but it can be either overcome or corrected. It is severe if the limitations present serious problems and use of the soils for a particular purpose is questionable. The degree of difficulty is very severe if extreme measures are needed to overcome the problem and in some areas use of the soils for a particular purpose is not feasible.

Climate [6]

Sequoyah County has a warm-temperate, continental climate. Storms bring ample precipitation when moisture-laden air from the Gulf of Mexico meets cooler, drier air from the Pacific and northern regions. The day-to-day weather is changeable. Seasons are well defined, and changes between seasons are gradual.

The most variable weather occurs in spring, when local storms are severe and bring large amounts of precipitation. The hard rains of spring may necessitate some replanting, but they fill reservoirs and ponds and usually provide enough moisture for initial plant growth and a reserve that is usable by the maturing crops. In summer, hot spells are relieved by cool nights, pleasant breezes, and occasional showers or thunderstorms. Autumn is a season of mild, sunny days interspersed with a few days of moderate to heavy, soaking rains. Winters are open and sunny. Cold, blustery weather persists for a few days at a time, but it is generally followed by moderate weather brought in on southerly winds. Long periods of intense cold and heavy snow are not common.

Weather records are kept at Sallisaw. The mean annual temperature is 61.5° F. The monthly average ranges from 40° in January to 82° in July. The average daily range in temperature is 24°. The lowest temperature on record was 19° below zero, in January 1930, and the highest was 115°, in August 1936. During the period from February through October, the temperature reaches 90° or above on an average of 81 days a year and 100° or above on 15 days a year in 5 out of 6 years. Temperatures of 32° or below can be expected on an average of 72 days out of the year, and temperatures below zero in 1 out of 5 years. A temperature of 10° below zero, or lower, occurs about once in 30 years. Table 7, p. 54, gives temperature and precipitation data based on records at Sallisaw for the period 1931 to 1960.

Table 8, p. 54, shows latest dates of specified low temperatures in spring and first in fall. These dates vary a few days, depending on elevation, ground conditions, and surface air drainage. The latest dates of freezing temperatures in spring at Sallisaw have ranged from February 11, in 1948, to May 4, in 1954. The earliest dates of freezing temperatures in fall have ranged from September 27, in 1942, to November 28, in 1950.

The mean annual precipitation ranges from 42.8 inches at Sallisaw to about 44 inches in the northeastern part of the county. The amount of precipitation at Sallisaw has ranged from 23.31 inches, in 1936, to 69.39 inches, in 1945. Webbers Falls, along the western boundary, received 72 inches in 1945. The year-to-year variation in the amount of precipitation is wide. In 8 out of 10 years the amount is between 31.6 and 57.9 inches. The seasonal distribution of rainfall is fairly even. About 31 percent falls in spring, 26 percent in summer, 23 percent in fall, and 20 percent in winter. July and the months from October through February are usually the driest months. During these periods there is less than 1 inch of rainfall in about 1 month out of 8. The largest daily amounts of rainfall occur in May, June, and August, when 3.5 to 6.3 inches falls in a single day about once every 3 years. The daily total of rainfall is 0.1 inch or more on an average of 62 days per year. The daily total is 0.5 inch or more on 29 days, and 1 inch or more on 13 days.

The average amount of snowfall from November through April ranges from 4.9 inches in the Sallisaw and Fort Smith areas to 5.5 inches in the northwestern part of the county. Snowfall totals more than 10 inches in only 1 year out of 7. A light snowfall of 2 inches or less occurs in 1 out of 3 years. Usually, even the deeper snows melt within 2 to 5 days.

No records of relative humidity, sunshine, windspeed, and evaporation are maintained at Sallisaw, but reasonable interpolations can be based on records from Fort Smith and other nearby stations. The relative humidity in winter averages nearly 82 percent at night and 63 percent in the afternoon. In summer it averages nearly 88 percent at night and 53 percent in the afternoon. The percentage of possible sunshine ranges from an average of 44 percent of the daylight hours in January to 73 percent in August, an annual average of 62 percent. The skies are clear during daylight hours on an average of 132 days out of the year. The hourly windspeed averages 8 miles per hour for the year and ranges from 10 miles per hour in March to 7 miles per hour in August. Northeasterly winds prevail except during the months of December through March, when the prevailing winds are from the east-northeast. Lake evaporation averages 47.5 inches annually. Of this amount, 72 percent occurs from May through October.

Tornadoes touch down in Sequoyah County in an average of 1 out of 6 years. During the past 91 years, 25 tornadoes have struck somewhere in the county, more than

[6] By STANEY G. HOLBROOK, State climatologist, U.S. Weather Bureau.

half of them in rural areas. About 80 percent of the storms that spawn tornadoes occur from April through June, but a warning system is maintained throughout the year. Severe hailstorms are considerably less of a threat than tornadoes, but five damaging hailstorms have been recorded in a period of 42 years.

Formation and Classification of the Soils

This section discusses the major factors of soil formation as they relate to the soils of Sequoyah County, the processes of soil formation, and the system of classifying soils into categories broader than the series.

Factors of Soil Formation

The properties of the soil at any given place result from the integrated effects of five major factors of soil formation: parent material, climate, plant and animal life, relief, and time.

Few generalizations can be made regarding the effect of any one factor because the effect of each is modified by the other four.

Parent material

Parent material is the unconsolidated material from which soil is formed. It influences the rate of soil formation, the chemical and mineralogical composition, and the color of the soil.

Several kinds of parent material underlie the soils of Sequoyah County. Most of the rock formations are of Pennsylvanian age. The alluvium is of Pleistocene and Recent age.

About two-thirds of the county is underlain by rocks of the Atoka Formation, which consists primarily of interbedded sandstone and shale. Soils of the Linker and Hector series formed in material derived from sandstone of this formation. Soils of the Enders series formed in material derived from the shale component.

The rest of the county is underlain mainly by rocks of the McAlester, Savanna, Boone, and St. Clair Formations, and by mixed alluvium. The McAlester and Savanna Formations consist of underclay (clay under a coal seam), coal, shale, siltstone, and sandstone. Some of the soils derived from these materials are those of the Stigler, Vian, Spiro, and Collinsville series. Soils of the Bodine series were derived from chert of the Boone Formation. Soils of the Sogn and Summit series were derived from limestone of the St. Clair Formation. The alluvium is mixed and variable. The parent material of soils of the Crevasse series was sandy alluvium, and that of soils of the Lela series was clayey alluvium. Several of the soils that formed in alluvium are intermediate in texture.

Climate

Sequoyah County has a warm-temperate climate. Precipitation is adequate for rapid leaching and for plant growth. The climate is fairly uniform throughout the county, and differences among the soils cannot be attributed to differences in climate.

Plant and animal life

The major influences of plant and animal life on the formation of soils in this county have been the addition of organic matter to the soils and the decomposition of this material through the action of micro-organisms. These influences have also brought about variations in fertility, structure, and color of the soils.

The kinds of plant community that are common in this county are prairie, savannah, and forest. Soils that formed under prairie vegetation, such as those of the Summit series, have a dark-colored surface layer and a moderately high content of organic matter. Soils that formed under savannah, such as those of the Stigler series, have a lighter colored surface layer and a moderate content of organic matter. Soils that have been strongly influenced by forest vegetation, such as those of the Linker series, have a lighter colored surface layer and a moderate to low content of organic matter.

Relief

Relief has influenced the formation of the soils mainly through its effect on the movement of water, on soil temperature, and on the kind of plant cover. The slope ranges from 0 to 50 percent. Most of the steep slopes are in the northern half of the county. Drainage is primarily to the south and east.

The soils are generally shallow in steep areas because water runs off rapidly and geologic erosion is excessive. For example, soils of the Hector series, which occupy some of the steepest slopes in the county, are shallow. In contrast, soils of the Stigler and Wrightsville series, which occupy level and nearly level areas, are deep.

Time

The length of time required for a soil to develop depends on the combined action and intensity of the other soil-forming factors. If, for example, the parent material is resistant and the relief is steep, geologic erosion continually exposes fresh parent rock and the interval of time required for soil formation is tremendously long.

The soils of Sequoyah County range from young to old. Old soils are those that have clearly expressed horizons; young soils are those that do not. Soils of the Stigler, Vian, and Pickwick series, which have a well-developed profile, are examples of old soils. Soils of the Robinsonville, Yahola, and Crevasse series, which have a weakly developed profile, are examples of young soils. Soils of the Hector, Collinsville, and Sogn series are examples of steep soils that developed in resistant parent material.

Processes of Soil Formation

Several processes were involved in the formation of the soils of this county. These processes are the accumulation of organic matter, the leaching of calcium carbonates and bases, the reduction and transfer of iron, and the formation and translocation of silicate clay minerals. The results of these processes are not evident to the same degree in all the soils of the county.

Most of the older soils in the county have three major horizons. Some of the properties in which the major horizons differ are color, texture, structure, consistence, reaction, organic-matter content, and thickness. Subdivisions of the major horizons are based on minor differences.

TABLE 6.—*Degree and nature of limitations*

Soil series and map symbols	Septic tank filter fields	Sewage lagoons	Sites for nonindustrial buildings
Bodine: BsF	Severe: stones; slope	Severe: stones; slope	Severe: stones; slope of 15 to 50 percent.
Brewer: Bw	Severe: slowly permeable; seldom flooded.	Slight: seldom flooded	Severe: moderately well drained; seldom flooded.
Cleora: Ce	Severe: occasionally flooded	Severe: occasionally flooded; moderately rapidly permeable.	Severe: occasionally flooded
Collinsville: CnE	Severe: rock at a depth of 1 to 4 feet.	Severe: stones; slope	Severe: slope of 5 to 20 percent; rock at a depth of 1 to 4 feet.
Crevasse: Cr	Severe: subject to flooding	Severe: rapidly permeable; subject to flooding.	Severe: subject to flooding
Hector-Linker-Enders complex: HeF	Severe: bedrock, shale, or dense clay at a depth of less than 4 feet.	Severe: stones; slope	Severe: slope of 5 to 40 percent; rock or shale at a depth of less than 4 feet.
Lafe: La	Severe: very slowly permeable.	Severe: dispersed, unstable material.	Very severe: dispersed, unstable material.
Latanier: Lc	Moderate: seldom flooded	Severe: high seepage rate below a depth of 2 feet.	Severe: seldom flooded
Lela: Lm	Severe: very slowly permeable; seldom flooded.	Slight: seldom flooded	Severe: somewhat poorly drained; seldom flooded.
Linker-Hector complex: LnC, LnD	Moderate: rock at a depth of 2 to 4 feet.	Moderate: rock at a depth of 2 to 4 feet.	Moderate: rock at a depth of 2 to 4 feet.
Linker and Stigler soils: LoD3	Severe: variable permeability.	Severe: variable permeability.	Severe: variable internal drainage.
Lonoke: LrA, LsA, LsB	Moderate: seldom flooded	Moderate: seldom flooded	Severe: seldom flooded
Mason: Ma	Moderate: seldom flooded	Moderate: seldom flooded	Severe: seldom flooded
McKamie: MkE	Severe: slowly permeable; clay at a depth of less than 1 foot.	Moderate to severe: slope	Severe: high shrink-swell potential.
Miller: Mr, Ms	Severe: very slowly permeable; seldom flooded.	Slight: seldom flooded	Severe: seldom flooded; somewhat poorly drained.
Muldrow: Mu	Severe: very slowly permeable; seldom flooded.	Slight: seldom flooded	Severe: seldom flooded; somewhat poorly dra ned.
Pickwick:			
PcB, PcC	Slight	Moderate: moderately permeable.	Slight
PcC2	Slight	Moderate: moderately permeable.	Slight
Razort: Ra	Moderate: seldom flooded	Moderate: moderate seepage rate; seldom flooded.	Severe: seldom flooded

of the soils for nonfarm uses

Trees and shrubs	Golf fairways	Picnic areas	Paths and trails	Parks and campgrounds
Moderate: stones; limited water-holding capacity.	Severe: coarse fragments.	Moderate to severe: stones; slope.	Moderate to severe: slope.	Severe: slope.
Slight	Moderate: fair traffic-supporting capacity.	Moderate: fair traffic-supporting capacity.	Moderate: fair traffic-supporting capacity.	Moderate: fair traffic-supporting capacity.
Slight	Moderate: occasionally flooded.	Moderate: occasionally flooded.	Moderate: occasionally flooded.	Moderate: occasionally flooded.
Moderate: restricted root growth.	Severe: slope; coarse fragments.	Moderate to severe: fair traffic-supporting capacity; stony surface.	Moderate: fair traffic-supporting capacity.	Moderate to severe: fair traffic-supporting capacity; slope; stony surface.
Moderate: droughty	Severe: low productivity.	Moderate: subject to flooding.	Severe: subject to flooding.	Severe: subject to flooding.
Moderate: shallow	Severe: slope; coarse fragments.	Moderate to severe: fair traffic-supporting capacity; stony surface; slope.	Moderate to severe: fair traffic-supporting capacity; slope.	Moderate to severe: fair traffic-supporting capacity; stony surface; slope.
Severe: toxic soil	Severe: low productivity.	Severe: very severe erodibility.	Severe: very severe erodibility.	Severe: very severe erodibility.
Moderate: root growth restricted in the surface layer.	Severe: poor traffic-supporting capacity.	Severe: poor traffic-supporting capacity.	Severe: poor traffic-supporting capacity.	Severe: poor traffic-supporting capacity.
Moderate: root growth restricted.	Severe: poor traffic-supporting capacity.	Severe: poor traffic-supporting capacity.	Severe: poor traffic-supporting capacity.	Severe: poor traffic-supporting capacity.
Moderate: root zone restricted in some places.	Moderate: fair traffic-supporting capacity.	Moderate: fair traffic-supporting capacity.	Moderate: fair traffic-supporting capacity.	Moderate: fair traffic-supporting capacity.
Moderate: root zone restricted because of erosion.	Severe: low productivity.	Severe: very severe erodibility.	Severe: very severe erodibility.	Severe: very severe erodibility.
Slight	Moderate: fair traffic-supporting capacity.	Moderate: fair traffic-supporting capacity.	Moderate: fair traffic-supporting capacity.	Moderate: fair traffic-supporting capacity.
Slight	Moderate: fair traffic-supporting capacity.	Moderate: fair traffic-supporting capacity.	Moderate: fair traffic-supporting capacity.	Moderate: fair traffic-supporting capacity.
Moderate: root growth restricted in the subsoil.	Moderate: fair traffic-supporting capacity.	Severe: very severe erodibility.	Severe: very severe erodibility.	Severe: very severe erodibility.
Moderate: root growth restricted.	Severe: poor traffic-supporting capacity; somewhat poorly drained.	Severe: poor traffic-supporting capacity; somewhat poorly drained.	Severe: poor traffic-supporting capacity; somewhat poorly drained.	Severe: poor traffic-supporting capacity; somewhat poorly drained.
Moderate: root growth restricted in the subsoil.	Severe: poor traffic-supporting capacity; somewhat poorly drained.	Severe: poor traffic-supporting capacity; somewhat poorly drained.	Severe: poor traffic-supporting capacity; somewhat poorly drained.	Severe: poor traffic-supporting capacity; somewhat poorly drained.
Slight	Moderate: fair traffic-supporting capacity.	Moderate: fair traffic-supporting capacity.	Moderate: fair traffic-supporting capacity.	Moderate: fair traffic-supporting capacity.
Moderate: erosion hinders establishment of trees and shrubs.	Moderate: fair traffic-supporting capacity.	Moderate: fair traffic-supporting capacity.	Moderate: fair traffic-supporting capacity.	Moderate: fair traffic-supporting capacity.
Slight	Slight	Slight	Slight	Slight.

TABLE 6.—*Degree and nature of limitations*

Soil series and map symbols	Septic tank filter fields	Sewage lagoons	Sites for nonindustrial buildings
Robinsonville: RoA, RoB	Moderate: seldom flooded	Severe: high seepage rate	Severe: seldom flooded
Rosebloom:			
Rs	Severe: very slowly permeable; occasionally flooded.	Slight	Very severe: poorly drained; occasionally flooded.
Rt	Severe: very slowly permeable; frequently flooded.	Severe: frequently flooded	Very severe: poorly drained; frequently flooded.
Ru	Severe: frequently flooded	Severe: frequently flooded	Very severe: frequently flooded.
Sallisaw:			
SaF	Moderate: slope	Severe: slope	Moderate to severe: slope of 8 to 30 percent.
SlB, SlC	Slight	Moderate: gravel at a depth of 2½ to 5 feet.	Slight
SlC2	Slight	Moderate: gravel at a depth of 2½ to 5 feet.	Slight
Sogn: SmF	Severe: rock or shale at a depth of 1 to 5 feet; variable permeability.	Severe: stony; slope	Severe: variable internal drainage; rock or shale at a depth of 1 to 5 feet.
Spiro: SnC	Slight to moderate: sandstone or shale at a depth of 2 to 4 feet.	Moderate: sandstone or shale at a depth of 2 to 4 feet.	Slight to moderate: sandstone or shale at a depth of 2 to 4 feet.
Stigler-Wrightsville silt loams: SoA	Severe: very slowly permeable.	Slight	Severe: somewhat poorly drained to poorly drained.
Stigler:			
SrA, SrB	Severe: very slowly permeable.	Slight	Severe: somewhat poorly drained.
SrC2	Severe: very slowly permeable.	Slight to moderate: slope	Severe: somewhat poorly drained.
Strip mines: St	Severe: variable soil material.	Severe: variable soil material.	Severe: variable soil material.
Summit: SuB, SuC	Severe: slowly permeable	Slight to moderate: slope	Severe: slowly permeable
Vian: VaB, VaC	Severe: moderately slowly permeable.	Slight to moderate: slope	Moderate: moderately slowly permeable; moderately well drained.
Yahola:			
Ya	Severe: occasionally flooded	Severe: occasionally flooded; moderately rapidly permeable.	Severe: occasionally flooded.
Yh	Moderate to severe: occasionally flooded; underlying clay.	Moderate: very slowly to moderately slowly permeable.	Severe: occasionally flooded.

of the soils for nonfarm uses—Continued

Trees and shrubs	Golf fairways	Picnic areas	Paths and trails	Parks and campgrounds
Slight	Slight	Slight	Slight	Slight.
Moderate: poorly drained	Severe: poorly drained	Severe: poorly drained	Severe: poorly drained	Severe: poorly drained.
Moderate: poorly drained; frequently flooded.	Severe: poorly drained; frequently flooded.	Severe: poorly drained; frequently flooded.	Severe: poorly drained; frequently flooded.	Severe: poorly drained; frequently flooded.
Moderate: frequently flooded; some areas are poorly drained.	Severe: frequently flooded.	Moderate: fair traffic-supporting capacity.	Severe: frequently flooded.	Severe: frequently flooded.
Moderate: droughty where soils are shallow.	Severe: slope; variable traffic-supporting capacity.	Moderate to severe: slope; variable traffic-supporting capacity.	Moderate to severe: slope; variable traffic-supporting capacity.	Moderate to severe: slope; variable traffic-supporting capacity.
Slight	Moderate: fair traffic-supporting capacity.	Moderate: fair traffic-supporting capacity.	Moderate: fair traffic-supporting capacity.	Moderate: fair traffic-supporting capacity.
Moderate: erosion hinders establishment of trees and shrubs.	Moderate: fair traffic-supporting capacity.	Moderate: fair traffic-supporting capacity.	Moderate: fair traffic-supporting capacity.	Moderate: fair traffic-supporting capacity.
Severe: shallow; droughty.	Severe: slope; coarse fragments.	Moderate to severe: fair traffic-supporting capacity; stony surface.	Moderate to severe: fair traffic-supporting capacity; stony surface.	Moderate to severe: fair traffic-supporting capacity; stony surface; slope.
Slight	Moderate: fair traffic-supporting capacity.	Moderate: fair traffic-supporting capacity.	Moderate: fair traffic-supporting capacity.	Moderate: fair traffic-supporting capacity.
Moderate: root growth restricted in the subsoil.	Moderate to severe: somewhat poorly drained to poorly drained.	Moderate to severe: somewhat poorly drained to poorly drained.	Moderate to severe: somewhat poorly drained to poorly drained.	Moderate to severe: somewhat poorly drained to poorly drained.
Moderate: root growth restricted in the subsoil.	Moderate: fair traffic-supporting capacity; somewhat poorly drained.	Moderate: fair traffic-supporting capacity; somewhat poorly drained.	Moderate: fair traffic-supporting capacity; somewhat poorly drained.	Moderate: fair traffic-supporting capacity; somewhat poorly drained.
Moderate: root growth restricted in the subsoil.	Moderate: fair traffic-supporting capacity; somewhat poorly drained.	Moderate: fair traffic-supporting capacity; somewhat poorly drained.	Moderate: fair traffic-supporting capacity; somewhat poorly drained.	Moderate: fair traffic-supporting capacity; somewhat poorly drained.
Moderate: variable soil material.	Severe: variable soil material.	Severe: variable soil material.	Severe: variable soil material.	Severe: variable soil material.
Moderate: root growth restricted in the subsoil.	Moderate: fair traffic-supporting capacity.	Moderate: fair traffic-supporting capacity.	Moderate: fair traffic-supporting capacity.	Moderate: fair traffic-supporting capacity.
Slight	Moderate: fair traffic-supporting capacity.	Moderate: fair traffic-supporting capacity.	Moderate: fair traffic-supporting capacity.	Moderate: fair traffic-supporting capacity.
Slight	Moderate: occasionally flooded.	Moderate: occasionally flooded.	Moderate: occasionally flooded.	Moderate: occasionally flooded.
Slight	Slight	Slight	Slight	Slight.

TABLE 7.—*Temperature and precipitation data*

[All data from Sallisaw; period of record, 1931–1960]

Month	Temperature				Precipitation				
	Average daily maximum	Average daily minimum	Two years in 10 will have at least 4 days with—		Average total	One year in 10 will have—		Days with a snow cover of 1 inch or more	Average depth of snow on days with snow cover
			Maximum temperature equal to or higher than—	Minimum temperature equal to or lower than—		Less than—	More than—		
	°F.	°F.	°F.	°F.	Inches	Inches	Inches	Number	Inches
January	51.0	29.0	69	12	2.57	0.3	6.5	1	3
February	55.3	32.2	71	17	3.22	.8	7.0	([1])	2
March	62.9	38.7	80	23	3.35	.7	7.2	([1])	4
April	73.3	49.5	86	33	4.43	1.7	8.6	0	------
May	80.3	58.2	90	47	5.68	1.5	11.9	0	------
June	88.6	66.9	98	57	4.87	.8	11.2	0	------
July	93.9	70.1	103	64	2.92	.8	8.1	0	------
August	94.1	69.3	105	60	3.31	.4	7.7	0	------
September	87.7	61.9	99	48	3.80	.8	8.7	0	------
October	76.9	50.7	89	36	3.07	.4	6.3	0	------
November	62.8	37.3	79	21	2.86	.7	5.9	0	------
December	53.4	31.5	71	17	2.68	.6	5.6	([1])	2
Year	73.4	49.6	[2] 104	[3] 5	42.76	31.6	57.9	1	3

[1] Less than half a day. [2] Average annual highest temperature. [3] Average annual lowest temperature.

TABLE 8.—*Probabilities of last occurrence of specified temperatures in spring, and first in fall*

[All data from Sallisaw; period of record, 1921–1950]

Probability	Dates for given probability and temperature				
	16° F.	20° F.	24° F.	28° F.	32° F.
Spring:					
1 year in 10, later than	March 3	March 10	March 27	April 9	April 19
2 years in 10, later than	February 23	March 3	March 20	April 3	April 14
5 years in 10, later than	February 8	February 16	March 8	March 23	April 4
Fall:					
1 year in 10, earlier than	November 28	November 23	November 4	October 26	October 14
2 years in 10, earlier than	December 5	November 29	November 10	October 31	October 19
5 years in 10, earlier than	December 18	December 11	November 22	November 9	October 29

The A horizon is the surface layer. The A1 horizon is a division of the surface layer in which there is an accumulation of organic matter. The A2 horizon is a division that is lighter colored and strongly leached of bases. Many of the soils of this county, such as those of the Vian series, have both A1 and A2 horizons.

The B horizon is the mineral horizon below the A horizon, generally called the subsoil. In the older soils of the county, such as those of the Stigler series, this is the horizon of maximum accumulation of silicate clay. The younger soils of the county, such as those of the Yahola series, do not have a B horizon.

The C horizon is the weathered rock material. It has been little affected by soil-forming processes but may have been modified by reduction of iron or accumulation of calcium carbonates.

The R horizon is the consolidated bedrock.

Classification of the Soils

Two systems of classifying soils have been used in the United States in recent years. The older system was adopted in 1938 (*2*) and later revised (*5*). The system currently used was adopted for general use by the National Cooperative Soil Survey in 1965 and supplemented in March 1967 (*7*). This system is under continual study, and readers interested in the development of the system should refer to the latest literature available (*4*). For example, changes in the classification system made since this survey was completed have modified the definitions of the Brewer, Lela, and Yahola series to the degree that soils of this county assigned to those respective series would now be correlated with other series.

Table 9 shows the classification of each of the soil series represented in Sequoyah County according to the present

system, and also the great soil group according to the 1938 system. Some of the soils in this county do not fit in a series that has been recognized in the classification system, but recognition of a separate series would not serve a useful purpose. Such soils are named for series they strongly resemble because they differ from those series in ways too small to be of consequence in interpreting their usefulness or behavior. Soil scientists designate such soils as taxadjuncts to the series for which they are named. In this survey, soils named in the Brewer, Lela, and Yahola series are taxadjuncts to those series.

The current system defines classes in terms of observable or measurable properties of soils. The properties chosen are primarily those that permit the grouping of soils that are similar in genesis. The classification is designed to encompass all soils. It has six categories. Beginning with the most inclusive, they are the order, the suborder, the great group, the subgroup, the family, and the series. These are briefly defined in the following paragraphs.

ORDER.—Ten soil orders are recognized in the current system. These are the Entisols, Vertisols, Inceptisols, Aridisols, Mollisols, Spodosols, Alfisols, Ultisols, Oxisols, and Histosols. The properties used to differentiate the soil orders are those that tend to give broad climatic groupings of soils. Two exceptions, the Entisols and Histosols, occur in many different climates. Six of the ten soil orders are represented in Sequoyah County. These are the Entisols, Vertisols, Inceptisols, Mollisols, Alfisols, and Ultisols.

SUBORDER.—Each order is divided into suborders, primarily on the basis of characteristics that seem to produce classes having genetic similarity. Mainly, these are characteristics that reflect either the presence or absence of waterlogging or soil differences resulting from the climate or vegetation. The climatic range is narrower than that of the orders.

GREAT GROUP.—Each suborder is divided into great groups, on the basis of uniformity in the kinds and sequence of major horizons and similarity of the significant features of corresponding horizons. The horizons considered are those in which clay, iron, or humus have accumulated and those that have pans that interfere with the growth of roots or the movement of water. The features selected are the self-mulching properties of clays, soil temperature, chemical composition (mainly calcium, magnesium, sodium, and potassium), and the like.

SUBGROUP.—Each great group is divided into subgroups, one representing the central (typic) segment of the group, and other groups, called intergrades, that have properties of one great group and also one or more properties of another great group, suborder, or order. Subgroups may also be established in those instances where soil properties intergrade outside the range of any other great group, suborder, or order.

FAMILY.—Families are established within a subgroup primarily on the basis of properties that affect the growth of plants or the behavior of soils in engineering use. Among the properties considered are texture, mineralogy, reaction, soil temperature, permeability, thickness of horizons, and consistence.

TABLE 9.—*Classification of soil series of Sequoyah County*

Series	Family	Subgroup and great group	Order	Great soil group (1938 classification) [1]
Bodine	Loamy, skeletal, siliceous, thermic	Typic Paleudult	Ultisol	Red-Yellow Podzolic.
Brewer	Fine, mixed, thermic	Pachic Argiustoll	Mollisol	Brunizem.
Cleora	Coarse-loamy, mixed, thermic	Fluventic Hapludoll	Mollisol	Alluvial.
Collinsville	Loamy, mixed, thermic	Lithic Hapludoll	Mollisol	Lithosol.
Crevasse	Mixed, thermic	Typic Udipsamment	Entisol	Alluvial.
Enders	Clayey, mixed, thermic	Typic Hapludult	Ultisol	Red-Yellow Podzolic.
Ennis	Fine-loamy, siliceous, thermic	Fluventic Dystrochrept	Inceptisol	Alluvial.
Hector	Loamy, siliceous, thermic	Lithic Dystrochrept	Inceptisol	Lithosol.
Lafe	Fine-silty, mixed, thermic	Glossic Natraqualf	Alfisol	Solodized Solonetz.
Latanier	Clayey over loamy, mixed, thermic	Vertic Hapludoll	Mollisol	Alluvial.
Lela	Fine, mixed, thermic	Typic Chromudert	Vertisol	Grumusol.
Linker	Fine-loamy, mixed, thermic	Typic Hapludult	Ultisol	Red-Yellow Podzolic.
Lonoke	Coarse-loamy, siliceous, thermic	Mollic Hapludalf	Alfisol	Alluvial.
Mason	Fine-silty, mixed, thermic	Typic Argiudoll	Mollisol	Brunizem.
McKamie	Fine, mixed, thermic	Vertic Hapludalf	Alfisol	Red-Yellow Podzolic.
Miller	Fine, mixed, thermic	Vertic Haplustoll	Mollisol	Alluvial.
Muldrow	Fine, mixed, thermic	Typic Argiaquoll	Mollisol	Brunizem.
Pickwick	Fine-silty, mixed, thermic	Typic Paleudult	Ultisol	Red-Yellow Podzolic.
Razort	Fine-loamy, mixed, mesic	Mollic Hapludalf	Alfisol	Brunizem.
Robinsonville	Coarse-loamy, mixed, nonacid, thermic	Typic Udifluvent	Entisol	Alluvial.
Rosebloom	Fine-silty, mixed, acid, thermic	Fluventic Haplaquept	Inceptisol	Low-Humic Gley.
Sallisaw	Fine-loamy, mixed, thermic	Ultic Paleudalf	Alfisol	Red-Yellow Podzolic.
Sogn	Loamy, mixed, mesic	Lithic Haplustoll	Mollisol	Lithosol.
Spiro	Fine-silty, mixed, thermic	Mollic Hapludalf	Alfisol	Red-Yellow Podzolic.
Stigler	Fine, mixed, thermic	Aquultic Paleudalf	Alfisol	Red-Yellow Podzolic.
Summit	Fine, montmorillonitic, thermic	Vertic Argiudoll	Mollisol	Brunizem.
Vian	Fine-silty, mixed, thermic	Ultic Paleudalf	Alfisol	Red-Yellow Podzolic.
Wrightsville	Fine, mixed, thermic	Typic Glossaqualf	Alfisol	Planosol.
Yahola	Coarse-loamy, mixed, calcareous, thermic	Typic Ustifluvent	Entisol	Alluvial.

[1] As revised in 1949(*5*).

SERIES.—The series is a group of soils that have major horizons that, except for texture of the surface layer, are similar in important characteristics and in arrangement in the profile.

Literature Cited

(1) AMERICAN ASSOCIATION OF STATE HIGHWAY OFFICIALS.
1961. STANDARD SPECIFICATIONS FOR HIGHWAY MATERIALS AND METHODS OF SAMPLING AND TESTING. Ed. 8, 2 v., illus.

(2) BALDWIN, M., KELLOGG, C. E., and THORP, JAMES.
1938. SOIL CLASSIFICATION. In U.S. Dept. Agr. Ybk., 1232 pp., illus.

(3) PUTNAM, JOHN A., FURNIVAL, GEORGE M., and MCKNIGHT, J. S.
1960. MANAGEMENT AND INVENTORY OF SOUTHERN HARDWOODS. USDA Handbook No. 181, 102 pp., illus.

(4) SIMONSON, ROY W.
1962. SOIL CLASSIFICATION IN THE UNITED STATES. Sci., v. 137, No. 3535, pp. 1027–1034.

(5) THORP, JAMES, and SMITH, GUY D.
1949. HIGHER CATEGORIES OF SOIL CLASSIFICATION: ORDER, SUBORDER, AND GREAT SOIL GROUPS. Soil Sci. 67: 117–126.

(6) UNITED STATES DEPARTMENT OF AGRICULTURE.
1929. VOLUME, YIELD, AND STAND TABLES FOR SECOND-GROWTH SOUTHERN PINES. Misc. Pub. 50, 202 pp., Washington, D.C. (Out of print.)

(7) ———
1960. SOIL CLASSIFICATION, A COMPREHENSIVE SYSTEM, 7TH APPROXIMATION. 265 pp., illus. [Supplement issued in March 1967]

(8) WATERWAYS EXPERIMENT STATION, CORPS OF ENGINEERS.
1953. THE UNIFIED SOIL CLASSIFICATION SYSTEM. Tech. Memo. No. 3-357, 3 v., Vicksburg, Miss.

Glossary

Alluvium. Soil material, such as sand, silt, or clay, that has been deposited on land by streams.

Clay. As a soil separate, the mineral soil particles less than 0.002 millimeter in diameter. As a soil textural class, soil material that is 40 percent or more clay, less than 45 percent sand, and less than 40 percent silt.

Concretions. Grains, pellets, or nodules, of various sizes, shapes, and colors, consisting of concentrations of compounds, or of soil grains cemented together. The composition of some concretions is unlike that of the surrounding soil. Calcium carbonate and iron oxide are examples of material commonly found in concretions.

Consistence, soil. The feel of the soil and the ease with which a lump can be crushed by the fingers. Terms commonly used to describe consistence are—

Loose.—Noncoherent; will not hold together in a mass.

Friable.—When moist, crushes easily under gentle pressure between thumb and forefinger and can be pressed together into a lump.

Firm.—When moist, crushes under moderate pressure between thumb and forefinger, but resistance is distinctly noticeable.

Plastic.—When wet, readily deformed by moderate pressure but can be pressed into a lump; will form a wire when rolled between thumb and forefinger.

Sticky.—When wet, adheres to other material, and tends to stretch somewhat and pull apart, rather than to pull free from other material.

Hard.—When dry, moderately resistant to pressure; can be broken with difficulty between thumb and forefinger.

Soft.—When dry, breaks into powder in individual grains under very slight pressure.

Cemented.—Hard and brittle; little affected by moistening.

Depth, soil.—In this survey the following verbal descriptions of depth are used for the corresponding numerical range.

Very shallow.—10 inches or less
Shallow.—10 to 20 inches
Moderately deep.—20 to 30 inches
Deep.—30 inches or more

Horizon, soil.—A layer of soil, approximately parallel to the surface, that has distinct characteristics produced by soil-forming processes. These are the major horizons:

A horizon. The mineral horizon at the surface or just below an O horizon. This horizon is the one in which living organisms are most active and therefore is marked by the accumulation of humus. The horizon may have lost one or more of the following: soluble salts, clay, and sesquioxides (iron and aluminum oxides).

B horizon. The mineral horizon below an A horizon. The B horizon is in part a layer of change from the overlying A to the underlying C horizon. The B horizon also has distinctive characteristics caused by (1) accumulation of clay, sesquioxides, humus, or some combination of these; (2) prismatic or blocky structure; (3) redder or stronger colors than the A horizon; or (4) some combination of these. Combined A and B horizons are usually called the solum, or true soil. If a soil lacks a B horizon, the A horizon alone is the solum.

C horizon. The weathered rock material immediately beneath the solum. In most soils this material is presumed to be like that from which the overlying horizons were formed. If the material is known to be different from that in the solum, a Roman numeral precedes the letter C.

R layer. Consolidated rock beneath the soil. The rock usually underlies a C horizon but may be immediately beneath an A or B horizon.

Mottled. Irregularly marked with spots of different colors that vary in number and size. Mottling in soils usually indicates poor aeration and lack of drainage. Descriptive terms are as follows: Abundance—*few, common,* and *many;* size—*fine, medium,* and *coarse;* and contrast—*faint, distinct,* and *prominent.* The size measurements are these: *fine,* less than 5 millimeters (about 0.2 inch) in diameter along the greatest dimension; *medium,* ranging from 5 millimeters to 15 millimeters (about 0.2 to 0.6 inch) in diameter along the greatest dimension; and *coarse,* more than 15 millimeters (about 0.6 inch) in diameter along the greatest dimension.

Ped. An individual natural soil aggregate, such as a crumb, a prism, or a block, in contrast to a clod.

Permeability. The quality of a soil horizon that enables water or air to move through it. Terms used to describe permeability are as follows: *very slow, slow, moderately slow, moderate, moderately rapid, rapid,* and *very rapid.*

Reaction, soil. The degree of acidity or alkalinity of a soil, expressed in pH values. A soil that tests to pH 7.0 is precisely neutral in reaction because it is neither acid nor alkaline. An acid, or "sour," soil is one that gives an acid reaction; an alkaline soil is one that is alkaline in reaction. In words, the degrees of acidity or alkalinity are expressed thus:

	pH		*pH*
Extremely acid	Below 4.5	Neutral	6.6 to 7.3
Very strongly acid	4.5 to 5.0	Mildly alkaline	7.4 to 7.8
Strongly acid	5.1 to 5.5	Moderately alkaline	7.9 to 8.4
Medium acid	5.6 to 6.0	Strongly alkaline	8.5 to 9.0
Slightly acid	6.1 to 6.5	Very strongly alkaline.	9.1 and higher

Sand. As a soil separate, individual rock or mineral fragments ranging from 0.05 millimeter to 2.0 millimeters in diameter. Most sand grains consist of quartz, but sand may be of any mineral composition. As a textural class, soil that is 85 percent or more sand and not more than 10 percent clay.

Silt. As a soil separate, individual mineral particles that range in diameter from the upper limit of clay (0.002 millimeter) to the lower limit of very fine sand (0.05 millimeter). As a textural class, soil that is 80 percent or more silt and less than 12 percent clay.

Slope, soil. The amount of rise or fall in feet for each 100 feet of horizontal distance, expressed as follows:

	Percent
Nearly level	0 to 1
Very gently sloping	1 to 3
Gently sloping	3 to 5
Sloping	5 to 8
Strongly sloping	8 to 12
Moderately steep	12 to 20
Steep	20+

Structure, soil. The arrangement of primary soil particles into compound particles or clusters that are separated from adjoining aggregates and have properties unlike those of an equal mass of unaggregated primary soil particles. The principal forms of soil structure are—*platy* (laminated), *prismatic* (vertical axis of aggregates longer than horizontal), *columnar* (prisms with rounded tops), *blocky* (angular or subangular), and *granular*. *Structureless* soils are (1) *single grain* (each grain by itself, as in dune sand) or (2) *massive* (the particles adhering together without any regular cleavage, as in many claypans and hardpans).

Texture, soil. The relative proportions of sand, silt, and clay particles in a mass of soil. The basic textural classes, in order of increasing proportion of fine particles, are *sand, loamy sand, sandy loam, loam, silt loam, silt, sandy clay loam, clay loam, silty clay loam, sandy clay, silty clay*, and *clay*. The sand, loamy sand, and sandy loam classes may be further divided by specifying "coarse," "fine," or "very fine."

Accessibility Statement

This document is not accessible by screen-reader software. The Natural Resources Conservation Service (NRCS) is committed to making its information accessible to all of its customers and employees. If you are experiencing accessibility issues and need assistance, please contact our Helpdesk by phone at (800) 457–3642 or by e-mail at ServiceDesk-FTC@ftc.usda.gov. For assistance with publications that include maps, graphs, or similar forms of information, you may also wish to contact our State or local office. You can locate the correct office and phone number at http://offices.sc.egov.usda.gov/locator/app.

The U.S. Department of Agriculture (USDA) prohibits discrimination in all of its programs and activities on the basis of race, color, national origin, age, disability, and where applicable, sex (including gender identity and expression), marital status, familial status, parental status, religion, sexual orientation, political beliefs, genetic information, reprisal, or because all or part of an individual's income is derived from any public assistance program. (Not all prohibited bases apply to all programs.) Persons with disabilities who require alternative means for communication of program information (Braille, large print, audiotape, etc.) should contact USDA's TARGET Center at (202) 720-2600 (voice and TDD).

To file a complaint of discrimination, write to:

USDA
Assistant Secretary for Civil Rights
Office of the Assistant Secretary for Civil Rights
1400 Independence Avenue, S.W., Stop 9410
Washington, DC 20250-9410

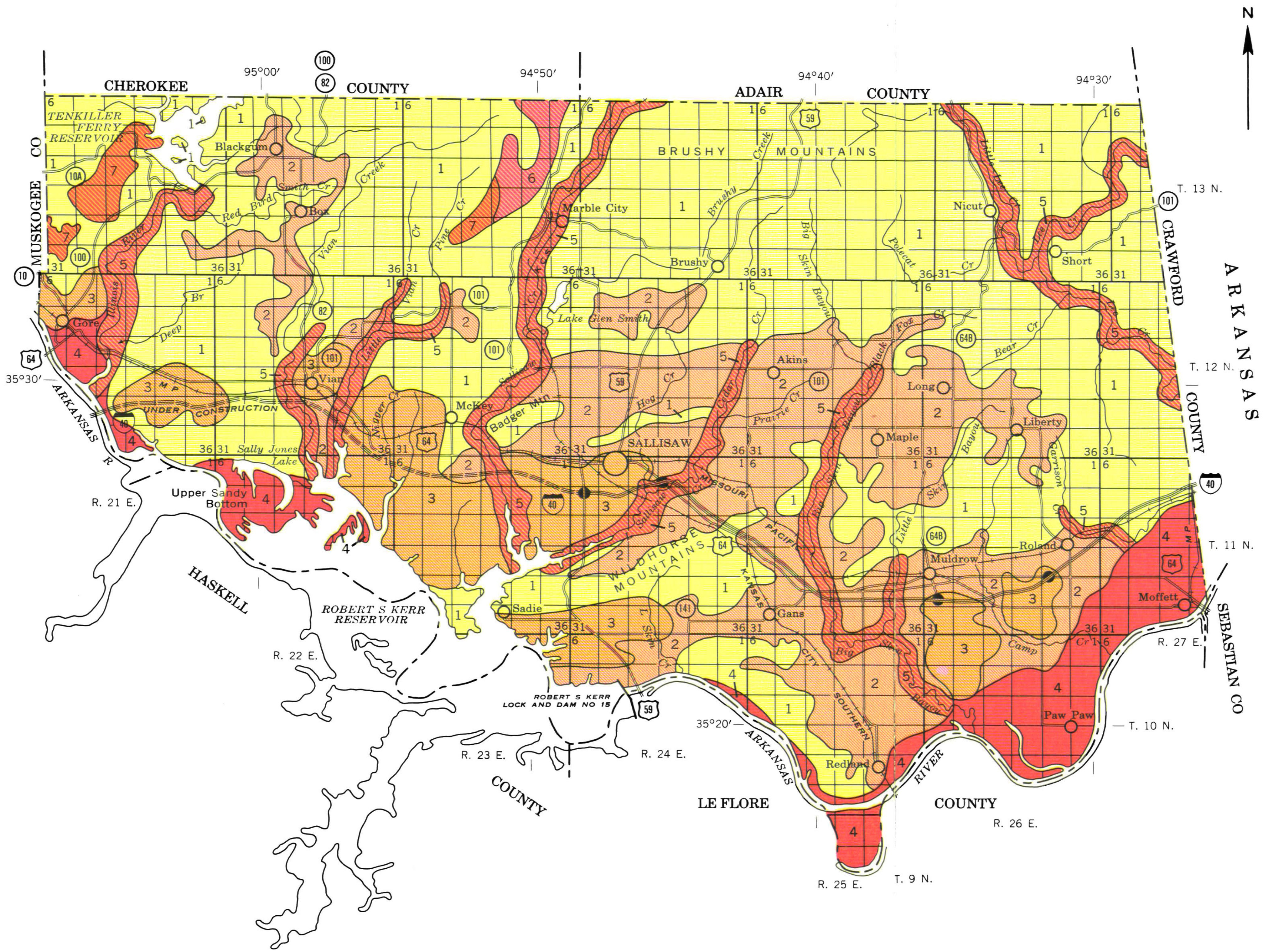
Or call toll-free at (866) 632-9992 (English) or (800) 877-8339 (TDD) or (866) 377-8642 (English Federal-relay) or (800) 845-6136 (Spanish Federal-relay). USDA is an equal opportunity provider and employer.

U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE
OKLAHOMA AGRICULTURAL EXPERIMENT STATION

GENERAL SOIL MAP

SEQUOYAH COUNTY, OKLAHOMA

SCALE IN MILES
1 0 1 2 3 4



SOIL ASSOCIATIONS

1 Hector–Linker–Enders association: Sloping to steep, somewhat excessively drained to moderately well drained, stony soils that are very shallow to deep over sandstone or shale; on uplands

2 Linker–Pickwick–Stigler association: Deep to moderately deep, very gently sloping to sloping, well-drained and somewhat poorly drained, loamy soils on uplands

3 Stigler–Vian–Spiro association: Deep to moderately deep, nearly level to gently sloping, somewhat poorly drained to well-drained, loamy soils on uplands

4 Yahola–Lonoke–Brewer association: Deep, level to undulating, well-drained and moderately well drained, loamy soils on flood plains

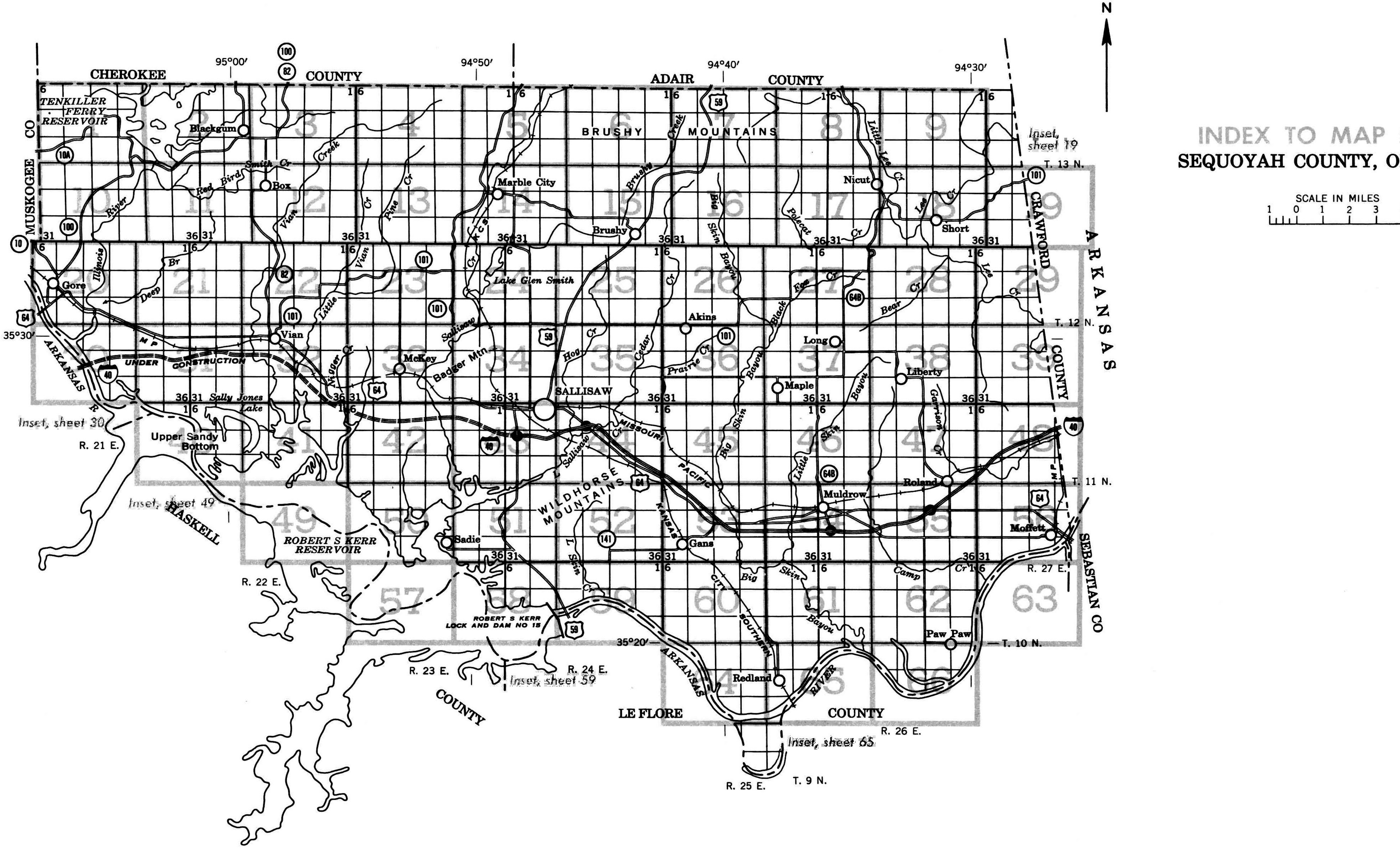
5 Rosebloom–Mason association: Deep, level to very gently sloping, poorly drained and well-drained, loamy soils on flood plains

6 Bodine association: Somewhat excessively drained, steep, stony and very cherty soils on uplands

7 Sogn–Summit association: Very gently sloping to steep, somewhat excessively drained and moderately well drained, loamy soils that are very shallow to deep over limestone; on uplands

January 1969

INDEX TO MAP SHEETS
SEQUOYAH COUNTY, OKLAHOMA



SOIL LEGEND

The first capital letter is the initial one of the soil name. A second capital letter, if used, shows the slope. Most symbols without a slope letter are those of nearly level soils, but some are for land types, such as Strip mines, that have a considerable range of slope. A final number, 2 or 3, in the symbol shows that the soil is eroded or severely eroded.

SYMBOL	NAME
BsF	Bodine stony silt loam, steep
Bw	Brewer silt loam
Ce	Cleora fine sandy loam
CnE	Collinsville complex, 5 to 20 percent slopes
Cr	Crevasse soils
HeF	Hector–Linker–Enders complex, 5 to 40 percent slopes
La	Lafe soils
Lc	Latanier clay
Lm	Lela clay
LnC	Linker–Hector complex, 2 to 5 percent slopes
LnD	Linker–Hector complex, 5 to 8 percent slopes
LoD3	Linker and Stigler soils, 2 to 8 percent slopes, severely eroded
LrA	Lonoke loam, nearly level
LsA	Lonoke silty clay loam, level
LsB	Lonoke silty clay loam, undulating
Ma	Mason silt loam
MkE	McKamie loam, 5 to 12 percent slopes
Mr	Miller clay
Ms	Miller silty clay loam
Mu	Muldrow silty clay loam
PcB	Pickwick loam, 1 to 3 percent slopes
PcC	Pickwick loam, 3 to 5 percent slopes
PcC2	Pickwick loam, 2 to 5 percent slopes, eroded
Ra	Razort fine sandy loam
RoA	Robinsonville fine sandy loam, level
RoB	Robinsonville fine sandy loam, undulating
Rs	Rosebloom silt loam, occasionally flooded
Rt	Rosebloom silt loam, frequently flooded
Ru	Rosebloom and Ennis soils, broken
SaF	Sallisaw complex, 8 to 30 percent slopes
SlB	Sallisaw loam, 1 to 3 percent slopes
SlC	Sallisaw loam, 3 to 5 percent slopes
SlC2	Sallisaw loam, 2 to 5 percent slopes, eroded
SmF	Sogn complex, 10 to 25 percent slopes
SnC	Spiro silt loam, 2 to 5 percent slopes
SoA	Stigler–Wrightsville silt loams, 0 to 1 percent slopes
SrA	Stigler silt loam, 0 to 1 percent slopes
SrB	Stigler silt loam, 1 to 3 percent slopes
SrC2	Stigler silt loam, 2 to 5 percent slopes, eroded
St	Strip mines
SuB	Summit silty clay loam, 1 to 3 percent slopes
SuC	Summit silty clay loam, 3 to 5 percent slopes
VaB	Vian silt loam, 1 to 3 percent slopes
VaC	Vian silt loam, 3 to 5 percent slopes
Ya	Yahola fine sandy loam
Yh	Yahola complex

CONVENTIONAL SIGNS

WORKS AND STRUCTURES

Highways and roads
- Dual
- Good motor
- Poor motor
- Trail

Highway markers
- National Interstate
- U. S.
- State or county

Railroads
- Single track
- Multiple track
- Abandoned

Bridges and crossings
- Road
- Trail, foot
- Railroad
- Ferry (FY)
- Ford (FORD)
- Grade
- R. R. over
- R. R. under
- Tunnel

Buildings
- School
- Church
- Station

Mines and Quarries
- Mine dump
- Pit, gravel
- Power line
- Pipeline
- Cemetery
- Dams
- Levee
- Tanks

BOUNDARIES

- National or state
- County
- Reservation
- Land grant
- Small park, cemetery, airport
- Land survey division corners

DRAINAGE

Streams, double-line
- Perennial
- Intermittent

Streams, single-line
- Perennial
- Intermittent
  - Crossable with tillage implements
  - Not crossable with tillage implements
  - Unclassified

Canals and ditches (CANAL)

Lakes and ponds
- Perennial (water, w)
- Intermittent

- Wells, water (flowing)
- Spring
- Marsh or swamp
- Wet spot
- Alluvial fan
- Drainage end

RELIEF

Escarpments
- Bedrock
- Other

Prominent peak

SOIL SURVEY DATA

- Soil boundary and symbol (Dx)
- Gravel
- Stony, very stony
- Rock outcrops
- Chert fragments
- Clay spot
- Sand spot
- Gumbo or scabby spot
- Made land
- Severely eroded spot
- Blowout, wind erosion
- Gully

Soil map constructed 1968 by Cartographic Division, Soil Conservation Service, USDA, from 1965 aerial photographs. Controlled mosaic based on Oklahoma plane coordinate system, north zone, Lambert conformal conic projection, 1927 North American datum.

GUIDE TO MAPPING UNITS

For a full description of a mapping unit, read both the description of the mapping unit and that of the soil series to which the mapping unit belongs. An outline of the capability classification of soils is given on pages 26 and 27. The capability units are not discussed separately. For a discussion of the suitability of a given soil for crops and pasture and of the management needed, see the discussion of the mapping unit. Other information is given in tables, as follows:

Acreage and extent, table 1, page 6.
Estimated average yields, table 2, page 28.

Engineering properties of the soils, tables 3, 4, and 5, pages 38 through 47.

Map symbol	Mapping unit	Described on page	Capability unit: Symbol	Range site: Name	Range site: Page	Woodland group: Number	Woodland group: Page
BsF	Bodine stony silt loam, steep-------	7	VIIs-3	Steep Chert Savannah	32	5	34
Bw	Brewer silt loam--------------------	7	I-1	None	--	3	34
Ce	Cleora fine sandy loam--------------	8	I-2	None	--	2	34
CnE	Collinsville complex, 5 to 20 percent slopes--------------------	8					
	Collinsville part---------------	--	VIIs-1	Shallow Prairie	30	None	--
	Unidentified part---------------	--	VIIs-1	Loamy Prairie	30	None	--
Cr	Crevasse soils----------------------	9	IVs-1	None	--	2	34
HeF	Hector-Linker-Enders complex, 5 to 40 percent slopes------------	10	VIIs-2	Shallow Savannah and Sandy Savannah	31	6	34
La	Lafe soils--------------------------	11	VIs-1	Slickspot	31	None	--
Lc	Latanier clay-----------------------	11	IIs-2	None	--	1	33
Lm	Lela clay---------------------------	12	IIIw-1	None	--	1	33
LnC	Linker-Hector complex, 2 to 5 percent slopes--------------------	13	IVe-1	Sandy Savannah and Shallow Savannah	31	6	34
LnD	Linder-Hector complex, 5 to 8 percent slopes--------------------	13	VIe-1	Sandy Savannah and Shallow Savannah	31	6	34
LoD3	Linker and Stigler soils, 2 to 8 percent slopes, severely eroded---	13					
	Linker part---------------------	--	VIe-3	Loamy Savannah	31	8	35
	Stigler part--------------------	--	VIe-3	Loamy Savannah	31	None	--
LrA	Lonoke loam, nearly level-----------	14	I-1	None	--	3	34
LsA	Lonoke silty clay loam, level-------	14	I-1	None	--	3	34
LsB	Lonoke silty clay loam, undulating------------------------	14	IIe-5	None	--	3	34
Ma	Mason silt loam---------------------	14	I-1	None	--	3	34
MkE	McKamie loam, 5 to 12 percent slopes---------------------------	15	VIe-2	Loamy Savannah	31	None	--
Mr	Miller clay-------------------------	15	IIIw-1	None	--	1	33
Ms	Miller silty clay loam--------------	16	IIIw-1	None	--	1	33
Mu	Muldrow silty clay loam-------------	16	IIw-1	None	--	1	33
PcB	Pickwick loam, 1 to 3 percent slopes---------------------------	17	IIe-4	None	--	7	35
PcC	Pickwick loam, 3 to 5 percent slopes---------------------------	17	IIIe-3	None	--	7	35
PcC2	Pickwick loam, 2 to 5 percent slopes, eroded--------------------	17	IIIe-5	None	--	8	35
Ra	Razort fine sandy loam--------------	18	I-1	None	--	3	34
RoA	Robinsonville fine sandy loam, level----------------------------	18	I-2	None	--	2	34

Map symbol	Mapping unit	Described on page	Capability unit: Symbol	Range site: Name	Range site: Page	Woodland group: Number	Woodland group: Page
RoB	Robinsonville fine sandy loam, undulating------------------------	18	IIe-3	None	--	2	34
Rs	Rosebloom silt loam, occasionally flooded------------------------	19	IIIw-3	None	--	4	34
Rt	Rosebloom silt loam, frequently flooded------------------------	19	Vw-1	None	--	4	34
Ru	Rosebloom and Ennis soils, broken---------------------------	19	Vw-1	None	--	4	34
SaF	Sallisaw complex, 8 to 30 percent slopes-------------------------	20	VIe-3	Smooth Chert Savannah	32	6	34
SlB	Sallisaw loam, 1 to 3 percent slopes-------------------------	19	IIe-4	Smooth Chert Savannah	32	7	35
SlC	Sallisaw loam, 3 to 5 percent slopes-------------------------	20	IIIe-3	Smooth Chert Savannah	32	7	35
SlC2	Sallisaw loam, 2 to 5 percent slopes, eroded-----------------	20	IIIe-5	Smooth Chert Savannah	32	8	35
SmF	Sogn complex, 10 to 25 percent slopes-------------------------	21					
	Sogn part---------------------	--	VIIs-4	Very Shallow	31	None	--
	Deeper part-------------------	--	VIIs-4	Loamy Savannah	31	None	--
SnC	Spiro silt loam, 2 to 5 percent slopes-------------------------	21	IVe-1	Loamy Prairie	30	None	--
SoA	Stigler-Wrightsville silt loams, 0 to 1 percent slopes----------	22					
	Stigler part------------------	--	IIIw-2	Loamy Savannah	31	None	--
	Wrightsville part-------------	--	IIIw-2	None	--	4	34
SrA	Stigler silt loam, 0 to 1 percent slopes-------------------------	22	IIs-1	Loamy Savannah	31	None	--
SrB	Stigler silt loam, 1 to 3 percent slopes-------------------------	22	IIe-2	Loamy Savannah	31	None	--
SrC2	Stigler silt loam, 2 to 5 percent slopes, eroded-----------------	22	IIIe-4	Loamy Savannah	31	None	--
St	Strip mines------------------------	22	VIIs-5	None	--	None	--
SuB	Summit silty clay loam, 1 to 3 percent slopes------------------	23	IIe-2	Loamy Prairie	30	None	--
SuC	Summit silty clay loam, 3 to 5 percent slopes------------------	23	IIIe-1	Loamy Prairie	30	None	--
VaB	Vian silt loam, 1 to 3 percent slopes-------------------------	24	IIe-1	Loamy Savannah	31	None	--
VaC	Vian silt loam, 3 to 5 percent slopes-------------------------	24	IIIe-2	Loamy Savannah	31	None	--
Ya	Yahola fine sandy loam------------	25	IIw-2	None	--	2	34
Yh	Yahola complex--------------------	25	IIw-2	None	--	3	34

327-754 O - 70 (Face Soil Maps) No. 1

1

(Joins Sheet 2)

(Joins Sheet 10)

0 ½ 1 Mile

Scale 1:20 000

0 5 000 Feet

This map is one of a set compiled in 1968 as part of a soil survey by the Soil Conservation Service, United States Department of Agriculture, and the Oklahoma Agricultural Experiment Station.
Land division corners are approximately positioned on this map.

SEQUOYAH COUNTY, OKLAHOMA NO. 1

SEQUOYAH COUNTY, OKLAHOMA — SHEET NUMBER 2

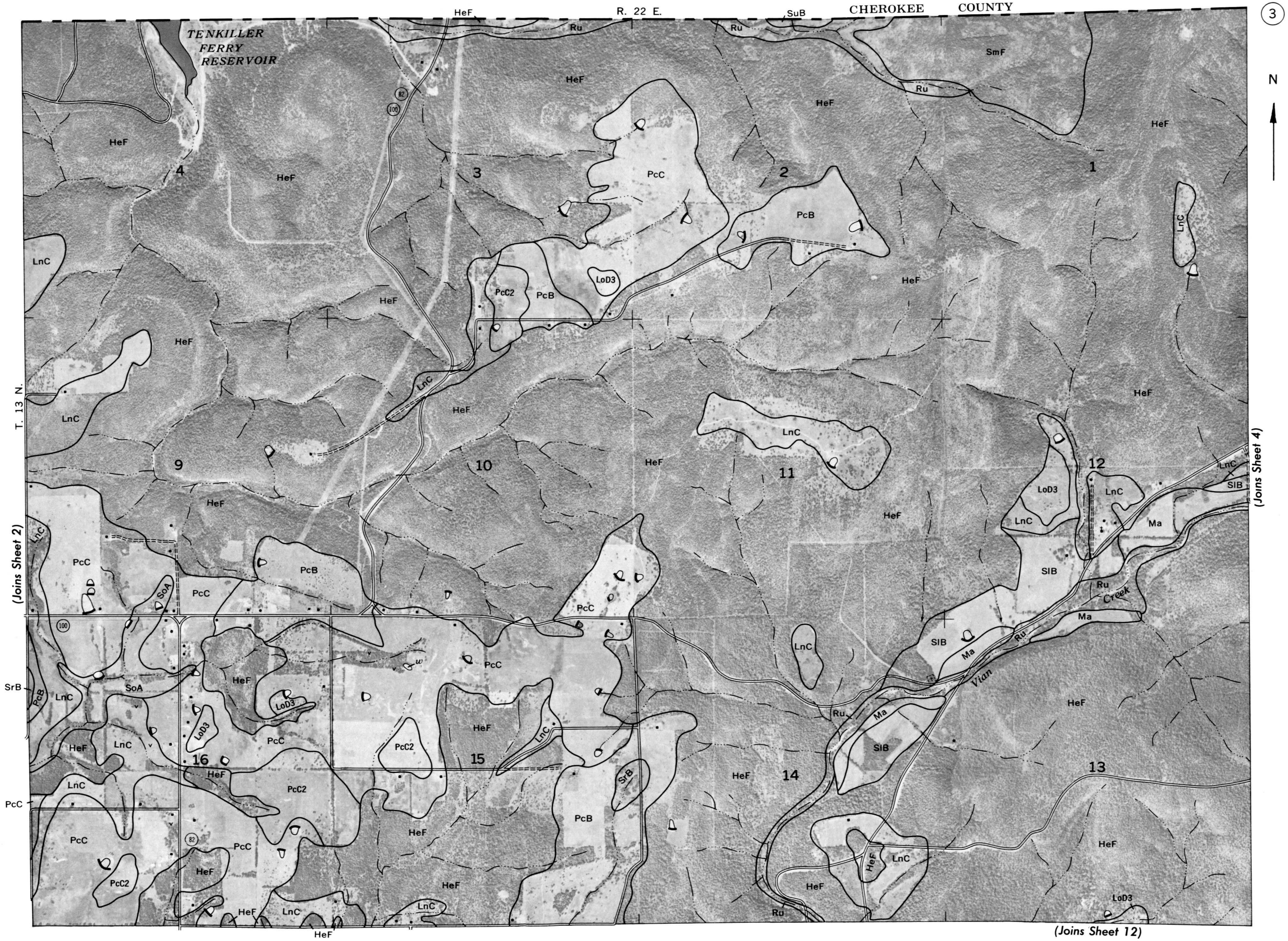
2

0 ½ 1 Mile Scale 1:20 000 0 5 000 Feet

SEQUOYAH COUNTY, OKLAHOMA NO. 2

Land division corners are approximately positioned on this map.

This map is one of a set compiled in 1968 as part of a soil survey by the Soil Conservation Service, United States Department of Agriculture, and the Oklahoma Agricultural Experiment Station.



0 ½ 1 Mile Scale 1:20 000 0 5 000 Feet

SEQUOYAH COUNTY, OKLAHOMA NO. 3

Land division corners are approximately positioned on this map.

This map is one of a set compiled in 1968 as part of a soil survey by the Soil Conservation Service, United States Department of Agriculture, and the Oklahoma Agricultural Experiment Station.

4

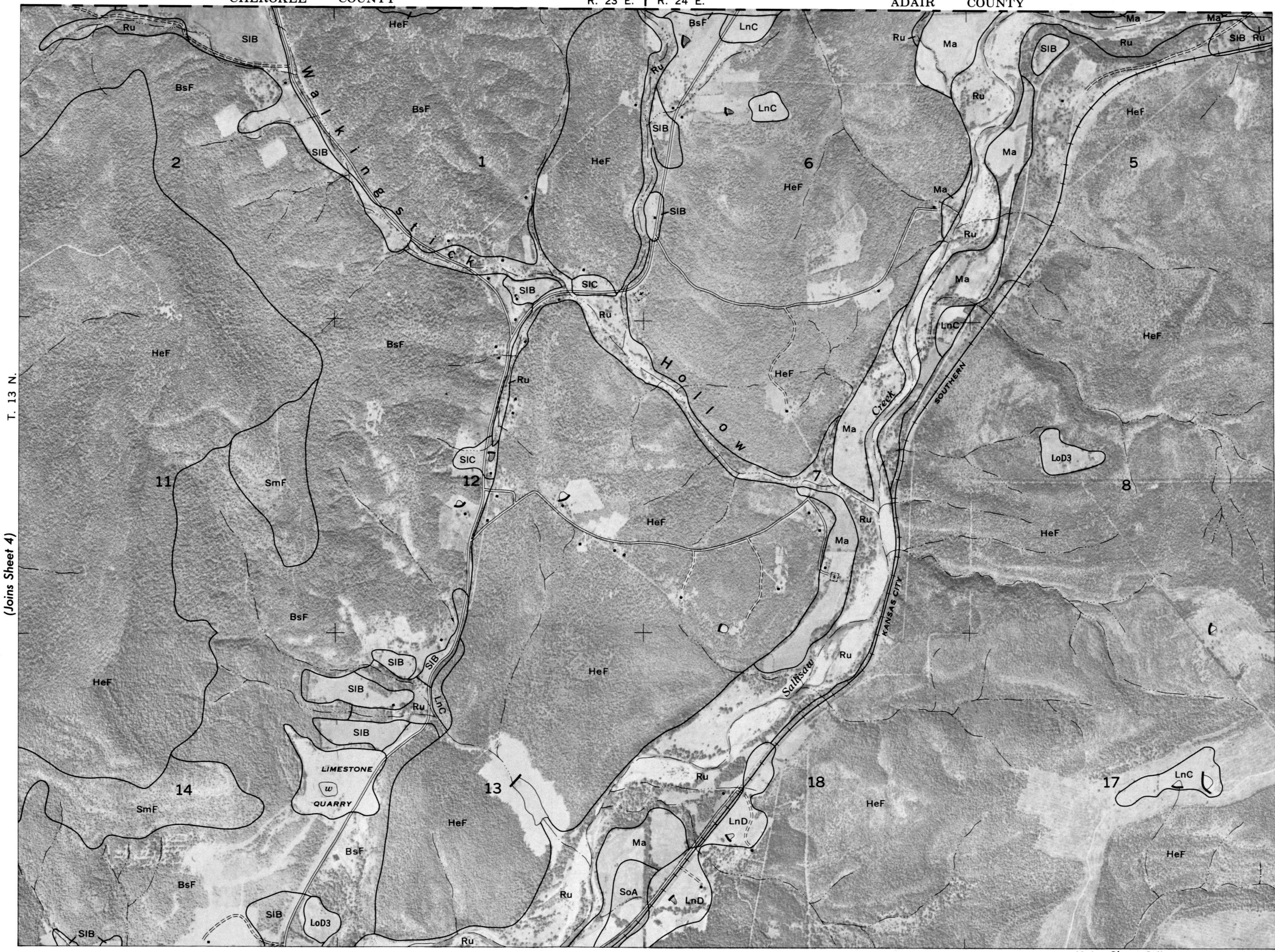
0 ½ 1 Mile Scale 1:20 000 0 5 000 Feet

SEQUOYAH COUNTY, OKLAHOMA NO. 4

Land division corners are approximately positioned on this map.

This map is one of a set compiled in 1968 as part of a soil survey by the Soil Conservation Service, United States Department of Agriculture, and the Oklahoma Agricultural Experiment Station.

This map is one of a set compiled in 1968 as part of a soil survey by the Soil Conservation Service, United States Department of Agriculture, and the Oklahoma Agricultural Experiment Station.
Land division corners are approximately positioned on this map.
SEQUOYAH COUNTY, OKLAHOMA NO. 5



0 ½ 1 Mile Scale 1:20 000 0 5 000 Feet

SEQUOYAH COUNTY, OKLAHOMA NO. 6

Land division corners are approximately positioned on this map.

This map is one of a set compiled in 1968 as part of a soil survey by the Soil Conservation Service, United States Department of Agriculture, and the Oklahoma Agricultural Experiment Station.

7

0 ½ 1 Mile

Scale 1:20 000

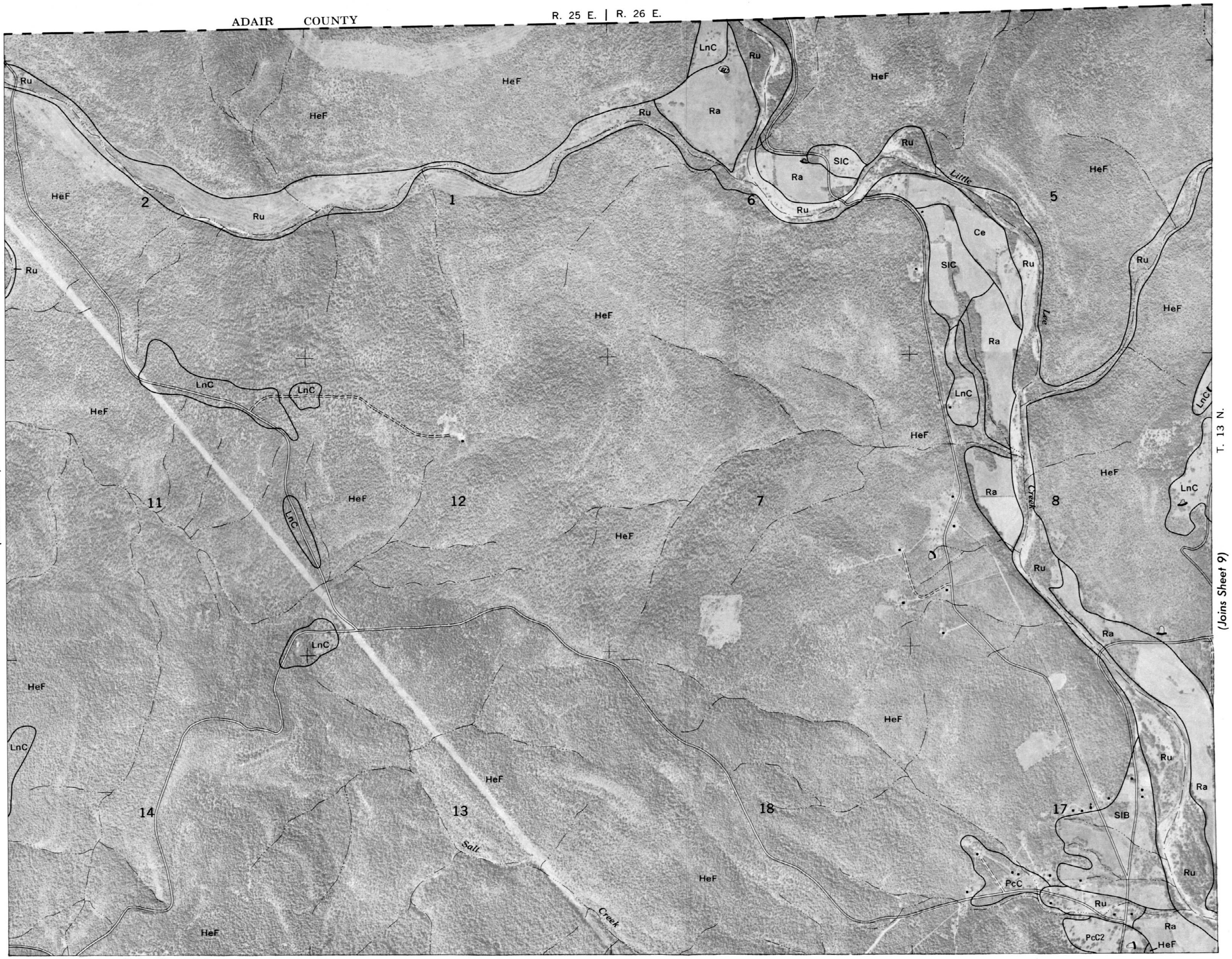
0 5 000 Feet

This map is one of a set compiled in 1968 as part of a soil survey by the Soil Conservation Service, United States Department of Agriculture, and the Oklahoma Agricultural Experiment Station.

Land division corners are approximately positioned on this map.

SEQUOYAH COUNTY, OKLAHOMA NO. 7

8



0 ½ 1 Mile Scale 1:20 000 0 5 000 Feet

SEQUOYAH COUNTY, OKLAHOMA NO. 8

Land division corners are approximately positioned on this map.

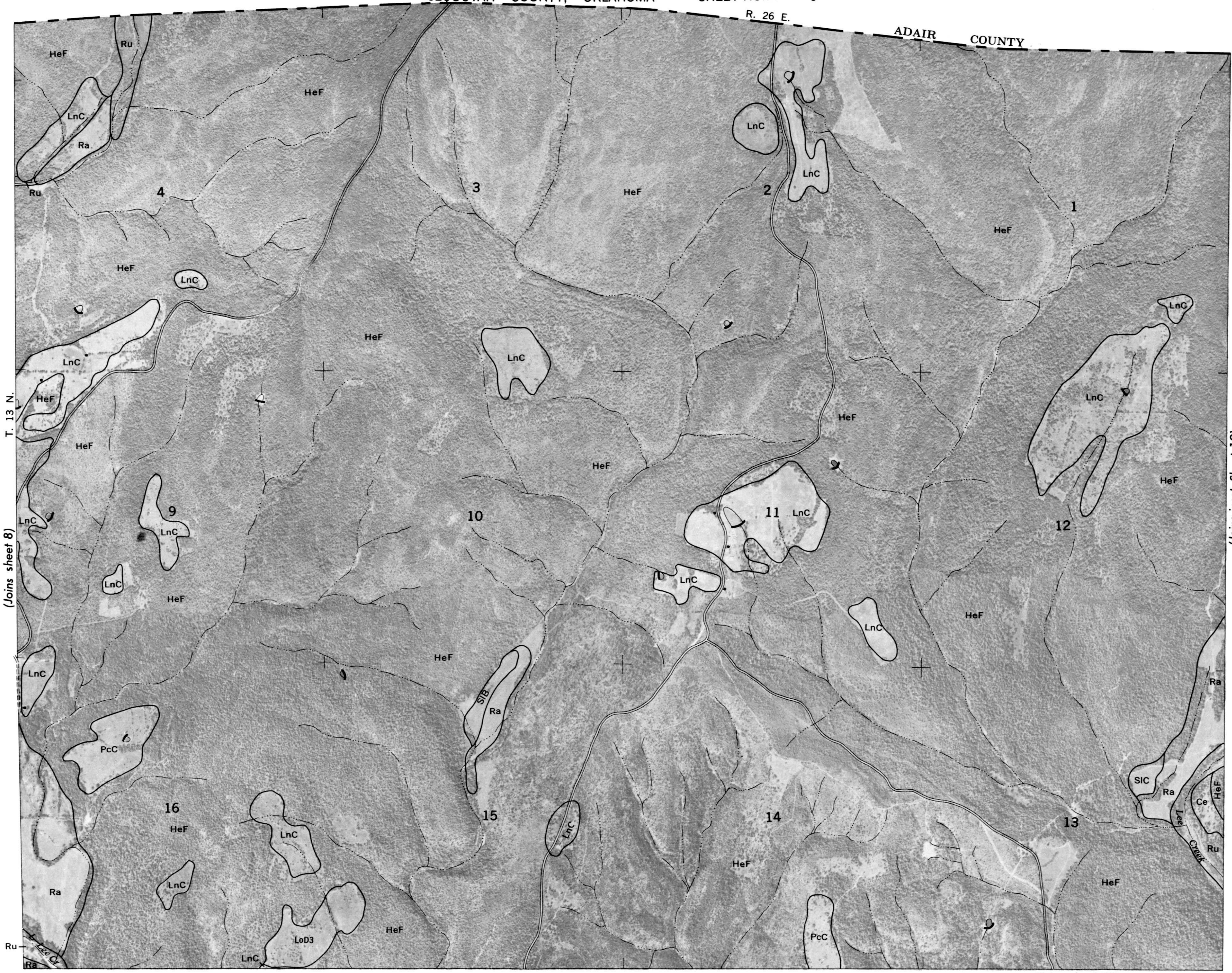
This map is one of a set compiled in 1968 as part of a soil survey by the Soil Conservation Service, United States Department of Agriculture, and the Oklahoma Agricultural Experiment Station.

This map is one of a set compiled in 1968 as part of a soil survey by the Soil Conservation Service, United States Department of Agriculture, and the Oklahoma Agricultural Experiment Station.
Land division corners are approximately positioned on this map.

SEQUOYAH COUNTY, OKLAHOMA NO. 9

Scale 1:20 000

5 000 Feet
1 Mile
½
0



0 ½ 1 Mile Scale 1:20 000 0 5 000 Feet

SEQUOYAH COUNTY, OKLAHOMA NO. 10
Land division corners are approximately positioned on this map.
This map is one of a set compiled in 1968 as part of a soil survey by the Soil Conservation Service, United States Department of Agriculture, and the Oklahoma Agricultural Experiment Station.

This map is one of a set compiled in 1968 as part of a soil survey by the Soil Conservation Service, United States Department of Agriculture, and the Oklahoma Agricultural Experiment Station.

Land division corners are approximately positioned on this map.

SEQUOYAH COUNTY, OKLAHOMA NO. 11

0 ½ 1 Mile Scale 1:20 000 0 5 000 Feet

12

(Joins Sheet 3)

(Joins Sheet 11)

(Joins Sheet 13)

(Joins Sheet 22) | (Joins Sheet 23)

0 ½ 1 Mile Scale 1:20 000 0 5 000 Feet

SEQUOYAH COUNTY, OKLAHOMA NO. 12

Land division corners are approximately positioned on this map.

This map is one of a set compiled in 1968 as part of a soil survey by the Soil Conservation Service, United States Department of Agriculture, and the Oklahoma Agricultural Experiment Station.

R. 23 E.

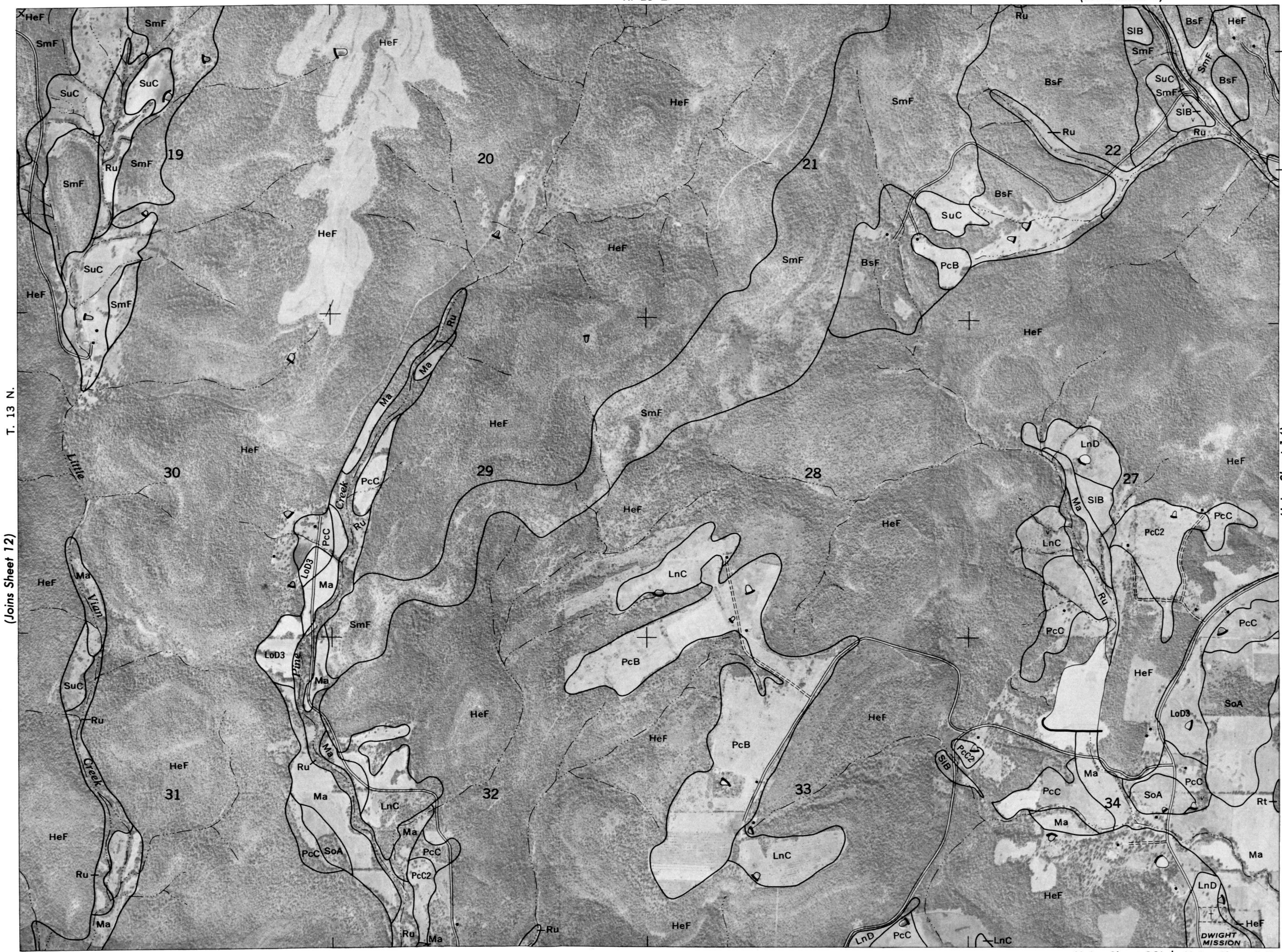
(Joins Sheet 4)

13

T. 13 N.

(Joins Sheet 12)

(Joins Sheet 14)



(Joins Sheet 23) | (Joins Sheet 24)

0 ½ 1 Mile

Scale 1:20 000

0 5 000 Feet

This map is one of a set compiled in 1968 as part of a soil survey by the Soil Conservation Service, United States Department of Agriculture, and the Oklahoma Agricultural Experiment Station.
Land division corners are approximately positioned on this map.

SEQUOYAH COUNTY, OKLAHOMA — SHEET NUMBER 14

0 ½ 1 Mile
Scale 1:20 000
0 5 000 Feet

SEQUOYAH COUNTY, OKLAHOMA NO. 14

Land division corners are approximately positioned on this map.

This map is one of a set compiled in 1968 as part of a soil survey by the Soil Conservation Service, United States Department of Agriculture, and the Oklahoma Agricultural Experiment Station.

15

R. 24 E.

(Joins Sheet 6)

T. 13 N.

(Joins Sheet 14)

(Joins Sheet 16)

(Joins Sheet 25) | (Joins Sheet 26)

0 ½ 1 Mile Scale 1:20 000 0 5 000 Feet

This map is one of a set compiled in 1968 as part of a soil survey by the Soil Conservation Service, United States Department of Agriculture, and the Oklahoma Agricultural Experiment Station.
Land division corners are approximately positioned on this map.
SEQUOYAH COUNTY, OKLAHOMA NO. 15

SEQUOYAH COUNTY, OKLAHOMA — SHEET NUMBER 16

16

(Joins Sheet 7)

R. 25 E.

N

(Joins Sheet 15)

T. 13 N.

(Joins Sheet 17)

(Joins Sheet 26) | (Joins Sheet 27)

0 ½ 1 Mile

Scale 1:20 000

0 5 000 Feet

SEQUOYAH COUNTY, OKLAHOMA NO. 16

Land division corners are approximately positioned on this map.

This map is one of a set compiled in 1968 as part of a soil survey by the Soil Conservation Service, United States Department of Agriculture, and the Oklahoma Agricultural Experiment Station.

17

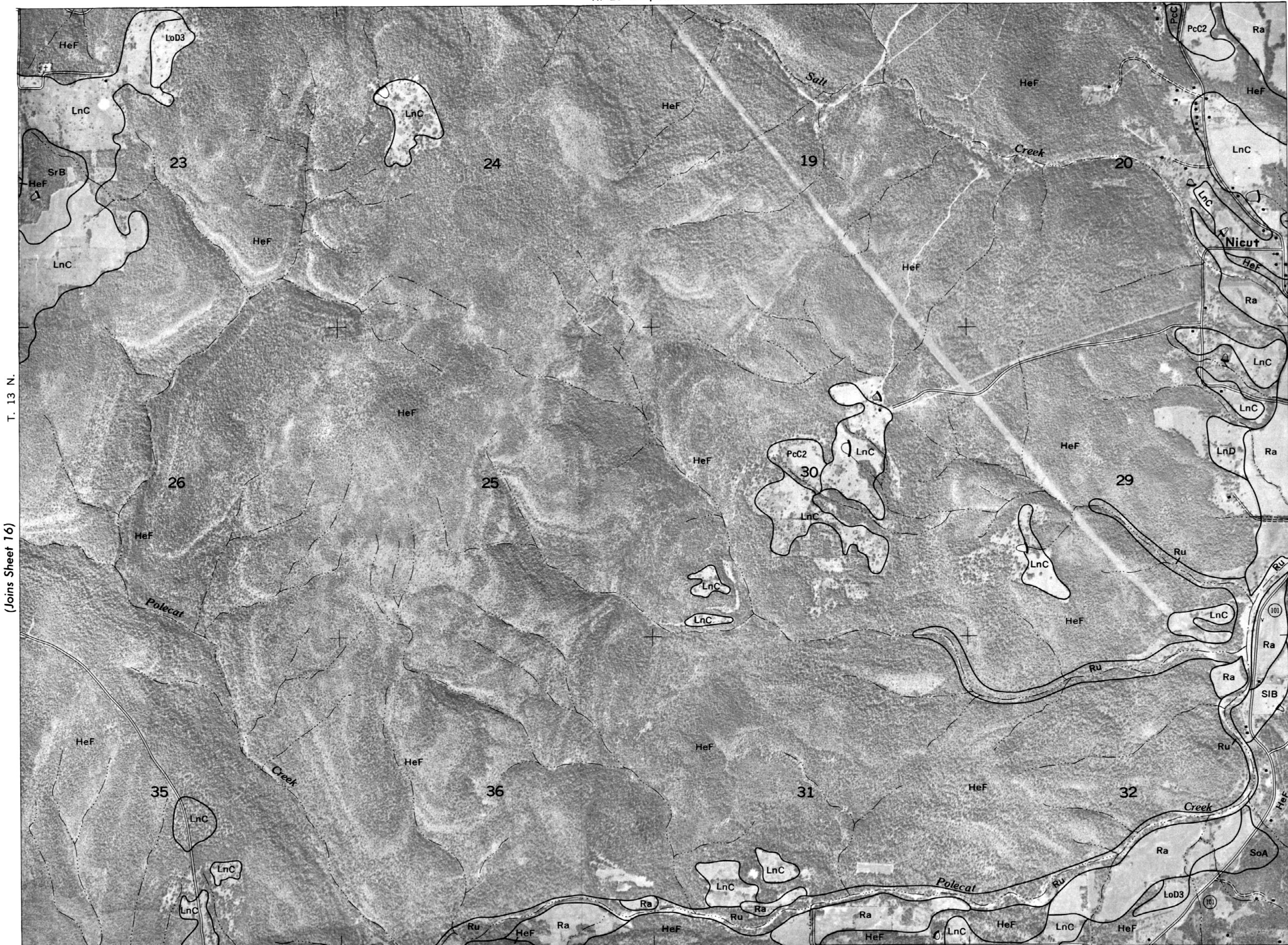
R. 25 E. | R. 26 E.

(Joins Sheet 8)

T. 13 N.

(Joins Sheet 16)

(Joins Sheet 18)



(Joins Sheet 27) | (Joins Sheet 28)

0 ½ 1 Mile

Scale 1:20 000

0 5 000 Feet

This map is one of a set compiled in 1968 as part of a soil survey by the Soil Conservation Service, United States Department of Agriculture, and the Oklahoma Agricultural Experiment Station.
Land division corners are approximately positioned on this map.

SEQUOYAH COUNTY, OKLAHOMA NO. 17

SEQUOYAH COUNTY, OKLAHOMA NO. 18

Land division corners are approximately positioned on this map.

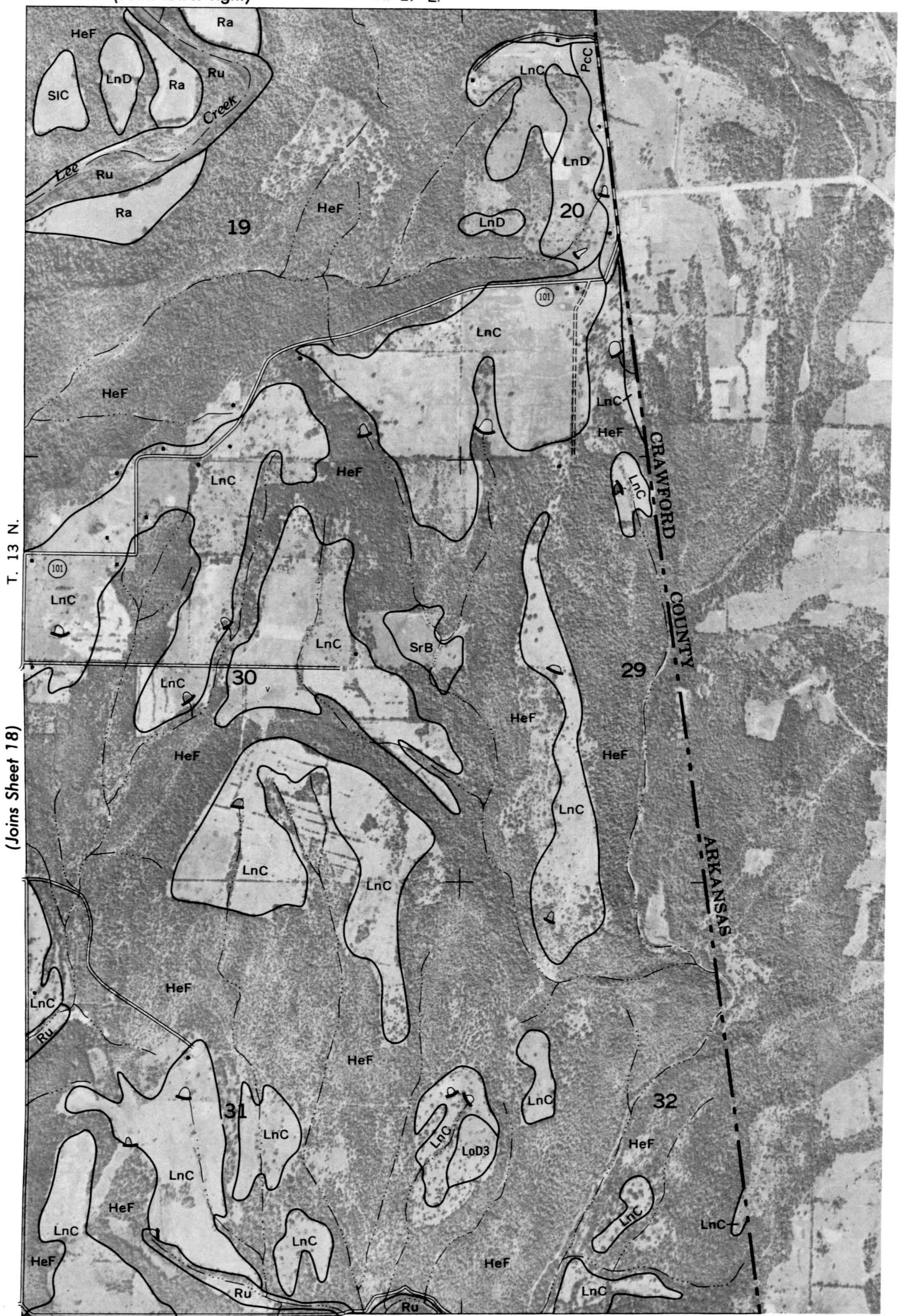
This map is one of a set compiled in 1968 as part of a soil survey by the Soil Conservation Service, United States Department of Agriculture, and the Oklahoma Agricultural Experiment Station.

19

N

(Joins lower right)

R. 27 E.

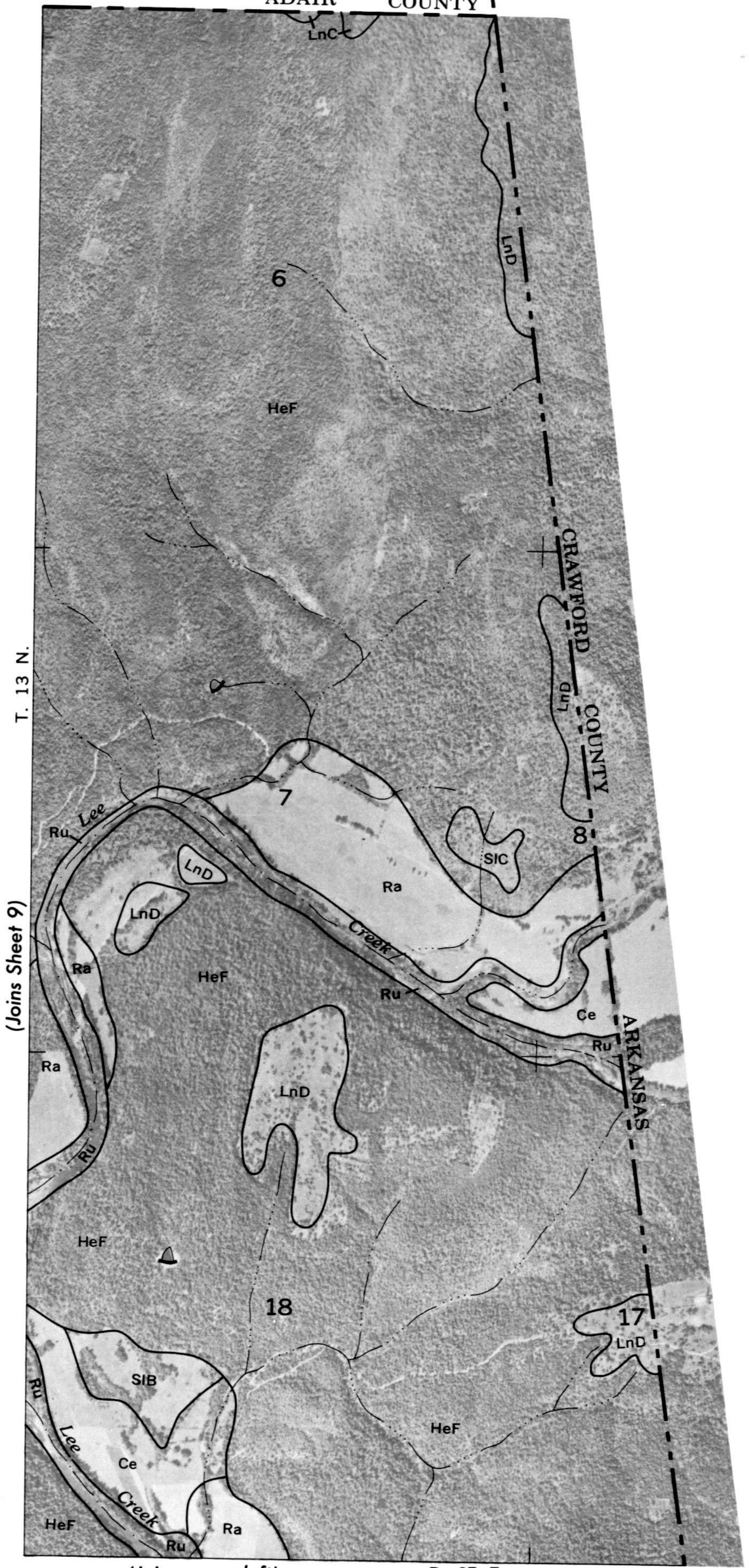


T. 13 N.

(Joins Sheet 18)

(Joins Sheet 29)

ADAIR COUNTY



T. 13 N.

(Joins Sheet 9)

(Joins upper left)

R. 27 E.

0 ½ 1 Mile

Scale 1:20 000

0 5 000 Feet

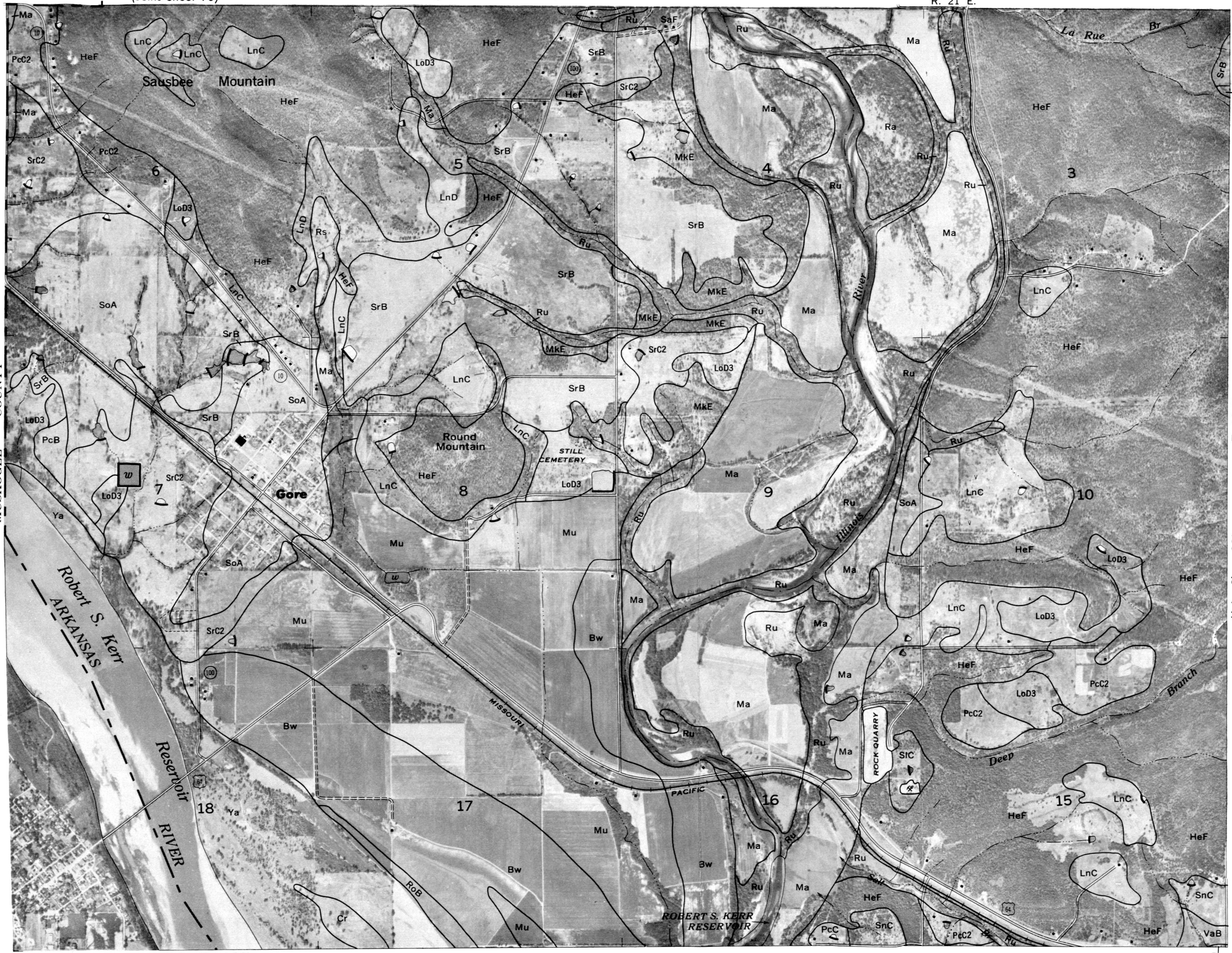
This map is one of a set compiled in 1968 as part of a soil survey by the Soil Conservation Service, United States Department of Agriculture, and the Oklahoma Agricultural Experiment Station.

Land division corners are approximately positioned on this map.

SEQUOYAH COUNTY, OKLAHOMA NO. 19

(Joins Sheet 10)

SEQUOYAH COUNTY, OKLAHOMA — SHEET NUMBER 20



(Joins Sheet 30)

0 ½ 1 Mile

Scale 1:20 000

0 5 000 Feet

SEQUOYAH COUNTY, OKLAHOMA NO. 20

Land division corners are approximately positioned on this map.

This map is one of a set compiled in 1968 as part of a soil survey by the Soil Conservation Service, United States Department of Agriculture, and the Oklahoma Agricultural Experiment Station.

(Joins Sh 10) | (Joins Sheet 11)

R. 21 E. | R. 22 E.

21

N

T. 12 N.

(Joins Sheet 20)

(Joins Sheet 22)

(Joins Sheet 31)

0 ½ 1 Mile

0 5 000 Feet

Scale 1:20 000

This map is one of a set compiled in 1968 as part of a soil survey by the Soil Conservation Service, United States Department of Agriculture, and the Oklahoma Agricultural Experiment Station.

Land division corners are approximately positioned on this map.

SEQUOYAH COUNTY, OKLAHOMA NO. 21

SEQUOYAH COUNTY, OKLAHOMA — SHEET NUMBER 22

(22)

0 ½ 1 Mile Scale 1:20 000 0 5 000 Feet

SEQUOYAH COUNTY, OKLAHOMA NO. 22

Land division corners are approximately positioned on this map.

This map is one of a set compiled in 1968 as part of a soil survey by the Soil Conservation Service, United States Department of Agriculture, and the Oklahoma Agricultural Experiment Station.

SEQUOYAH COUNTY, OKLAHOMA — SHEET NUMBER 23

(23)

0 ½ 1 Mile Scale 1:20 000 0 5 000 Feet

This map is one of a set compiled in 1968 as part of a soil survey by the Soil Conservation Service, United States Department of Agriculture, and the Oklahoma Agricultural Experiment Station.
Land division corners are approximately positioned on this map.
SEQUOYAH COUNTY, OKLAHOMA NO. 23

24

(Joins Sheet 13) | (Joins Sheet 14)

R. 23 E. | R. 24 E.

N

(Joins Sheet 23)

(Joins Sheet 25)

(Joins Sheet 34)

0 ½ 1 Mile

Scale 1:20 000

0 5 000 Feet

SEQUOYAH COUNTY, OKLAHOMA NO. 24

Land division corners are approximately positioned on this map.

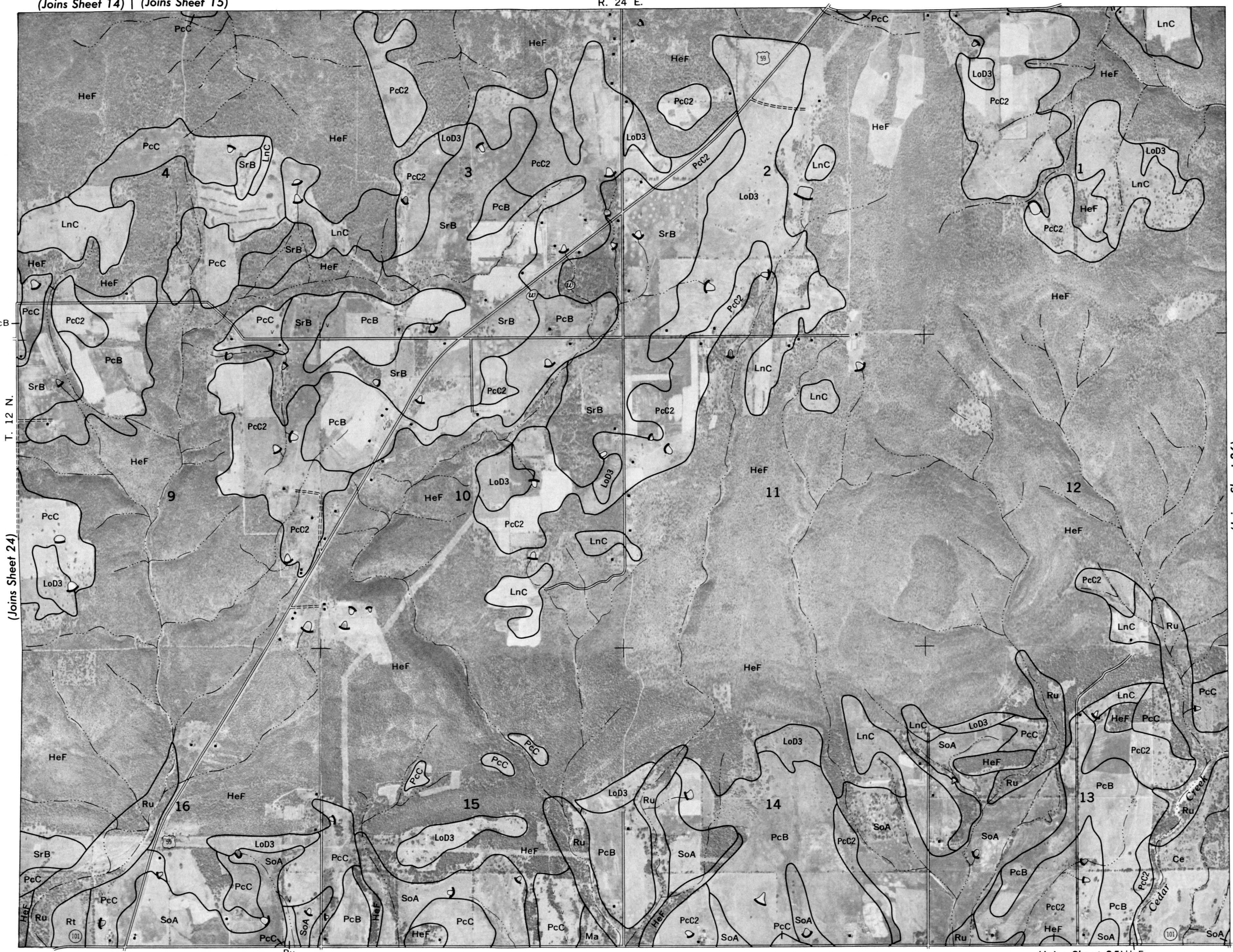
This map is one of a set compiled in 1968 as part of a soil survey by the United States Department of Agriculture, Soil Conservation Service, and the Oklahoma Agricultural Experiment Station.

SEQUOYAH COUNTY, OKLAHOMA — SHEET NUMBER 25

(Joins Sheet 14) | (Joins Sheet 15)

R. 24 E.

25



(Joins Sheet 24)

(Joins Sheet 26)

(Joins Sheet 35)

0 ½ 1 Mile Scale 1:20 000 0 5 000 Feet

This map is one of a set compiled in 1968 as part of a soil survey by the Soil Conservation Service, United States Department of Agriculture, and the Oklahoma Agricultural Experiment Station.
Land division corners are approximately positioned on this map.

SEQUOYAH COUNTY, OKLAHOMA NO. 25

SEQUOYAH COUNTY, OKLAHOMA NO. 26

Land division corners are approximately positioned on this map.

This map is one of a set compiled in 1968 as part of a soil survey by the Soil Conservation Service, United States Department of Agriculture, and the Oklahoma Agricultural Experiment Station.

SEQUOYAH COUNTY, OKLAHOMA — SHEET NUMBER 27

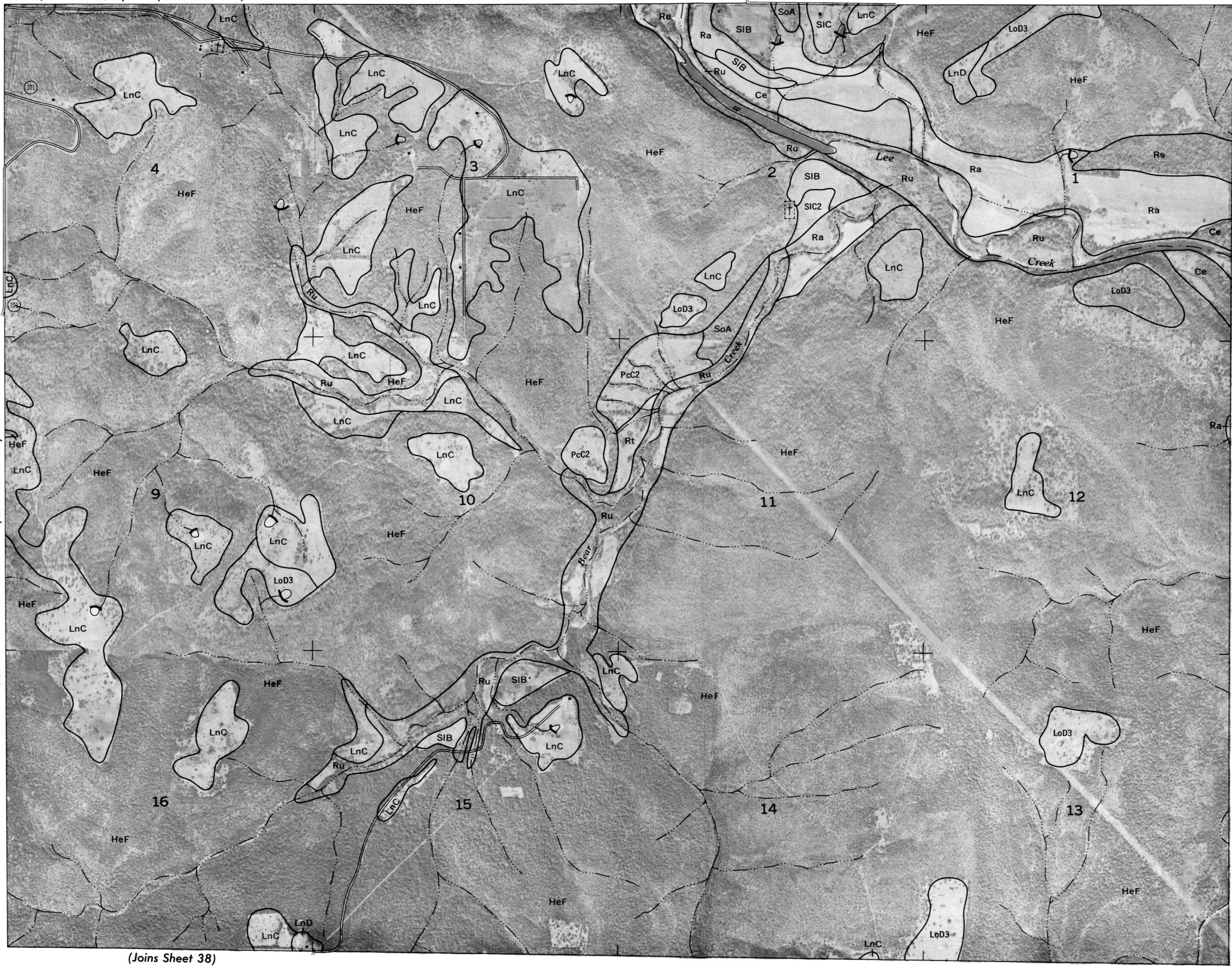
0 ½ 1 Mile
Scale 1:20 000
0 5 000 Feet

This map is one of a set compiled in 1968 as part of a soil survey by the Soil Conservation Service, United States Department of Agriculture, and the Oklahoma Agricultural Experiment Station.
Land division corners are approximately positioned on this map.
SEQUOYAH COUNTY, OKLAHOMA NO. 27

28

R. 26 E.

(Joins Sheet 17) | (Joins Sheet 18)



(Joins Sheet 27)

(Joins Sheet 29)

(Joins Sheet 38)

0 ½ 1 Mile

Scale 1:20 000

0 5 000 Feet

SEQUOYAH COUNTY, OKLAHOMA NO. 28

Land division corners are approximately positioned on this map.

This map is one of a set compiled in 1968 as part of a soil survey by the Soil Conservation Service, United States Department of Agriculture, and the Oklahoma Agricultural Experiment Station.

(29)

(Joins Sheet 18) | (Joins Sheet 19)

R. 27 E.

T. 12 N.

(Joins Sheet 28)

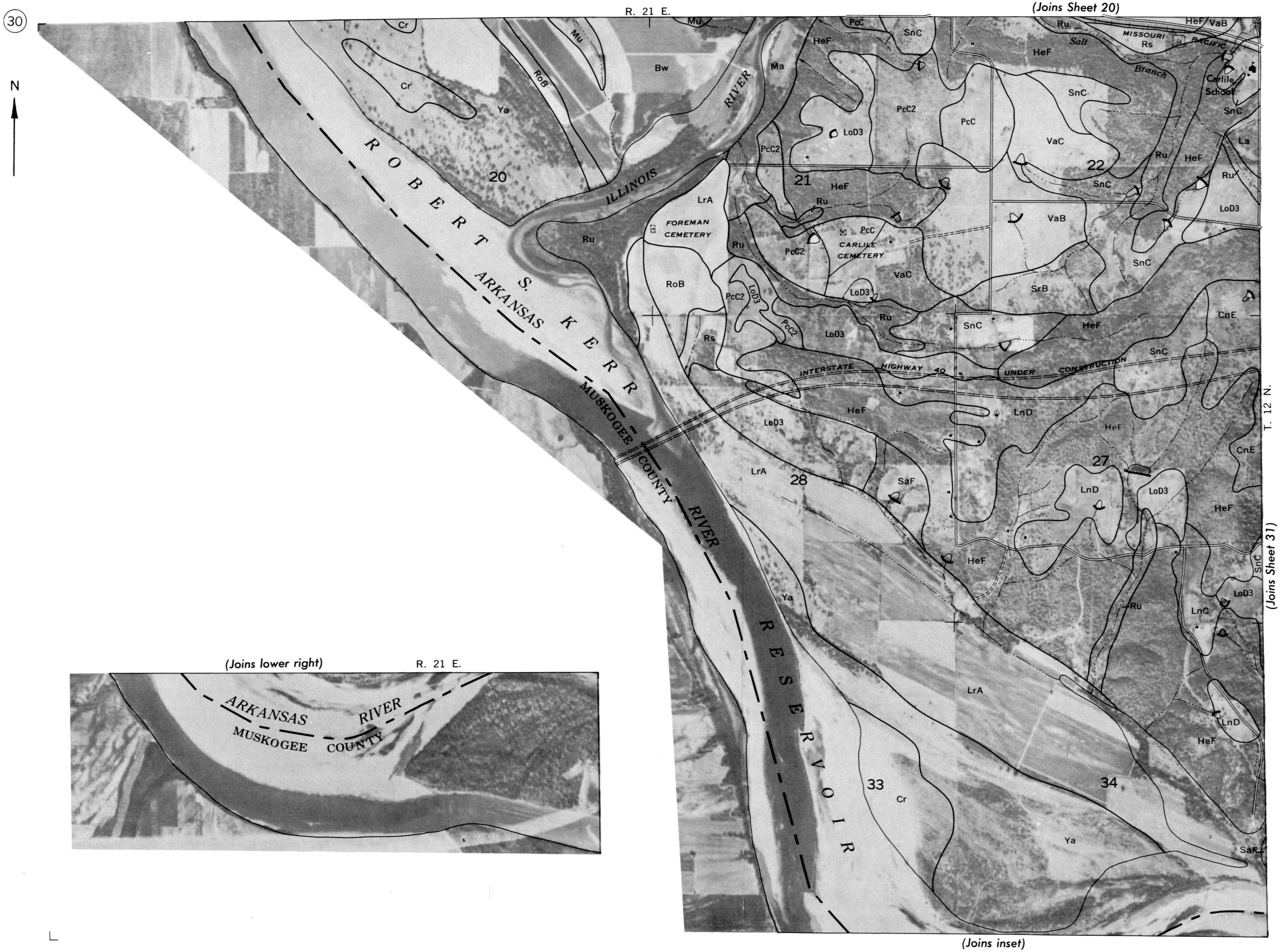
N

(Joins Sheet 39)

0 ½ 1 Mile Scale 1:20 000 0 5 000 Feet

This map is one of a set compiled in 1968 as part of a soil survey by the Soil Conservation Service, United States Department of Agriculture, and Oklahoma Agricultural Experiment Station.

Land division corners are approximately positioned on this map.



0 ½ 1 Mile Scale 1:20 000 0 5 000 Feet

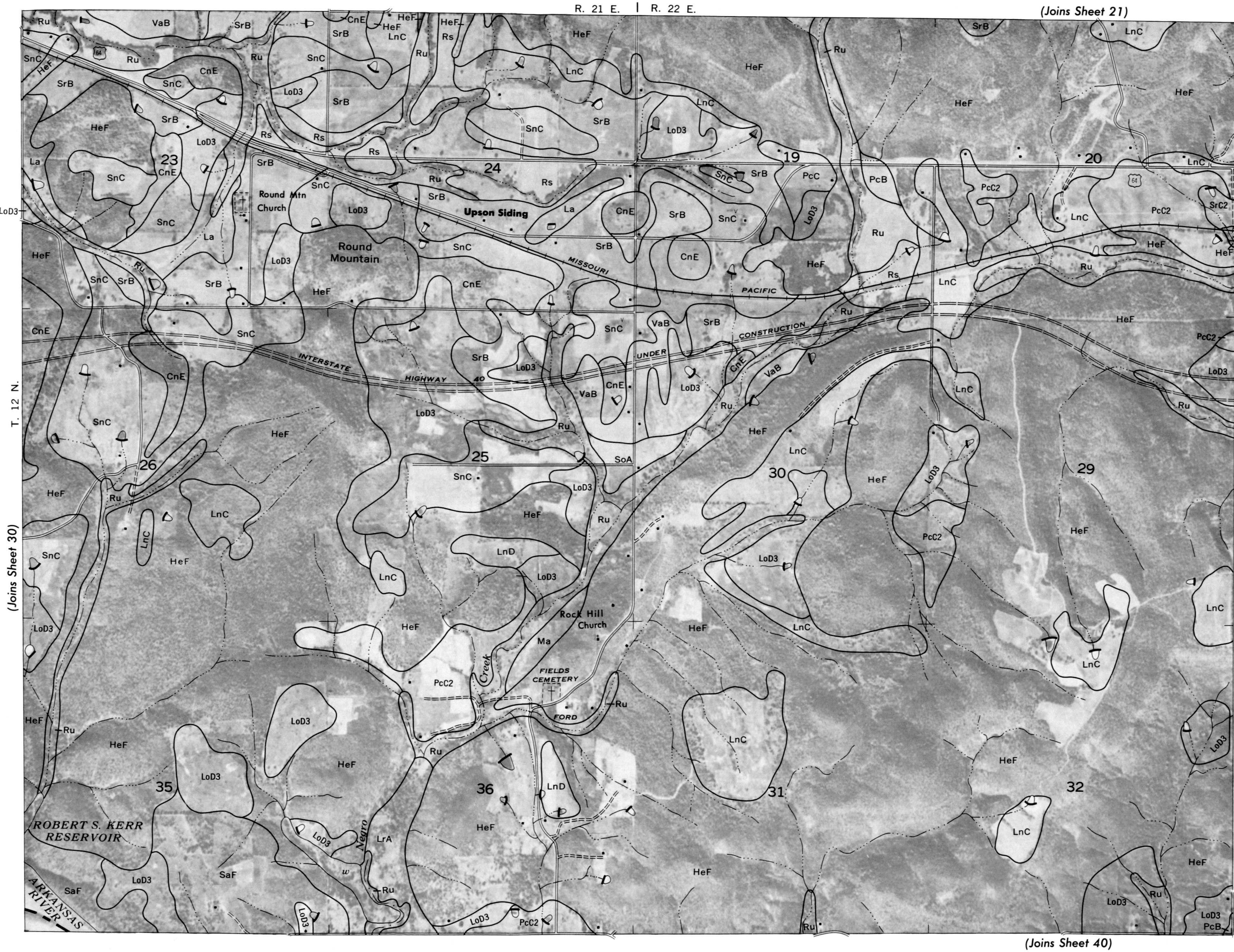
SEQUOYAH COUNTY, OKLAHOMA NO. 30

Land division corners are approximately positioned on this map.

This map is one of a set compiled in 1968 as part of a soil survey by the Soil Conservation Service, United States Department of Agriculture, and the Oklahoma Agricultural Experiment Station.

This map is one of a set compiled in 1968 as part of a soil survey by the Soil Conservation Service, United States Department of Agriculture, and the Oklahoma Agricultural Experiment Station.
Land division corners are approximately positioned on this map.

SEQUOYAH COUNTY, OKLAHOMA NO. 31



0 ½ 1 Mile Scale 1:20 000 0 5 000 Feet

0 ½ 1 Mile

Scale 1:20 000

0 5 000 Feet

SEQUOYAH COUNTY, OKLAHOMA NO. 32

Land division corners are approximately positioned on this map.

This map is one of a set compiled in 1968 as part of a soil survey by the Soil Conservation Service, United States Department of Agriculture, and the Oklahoma Agricultural Experiment Station.

This map is one of a set compiled in 1968 as part of a soil survey by the Soil Conservation Service, United States Department of Agriculture, and the Oklahoma Agricultural Experiment Station.
Land division corners are approximately positioned on this map.

SEQUOYAH COUNTY, OKLAHOMA NO. 33

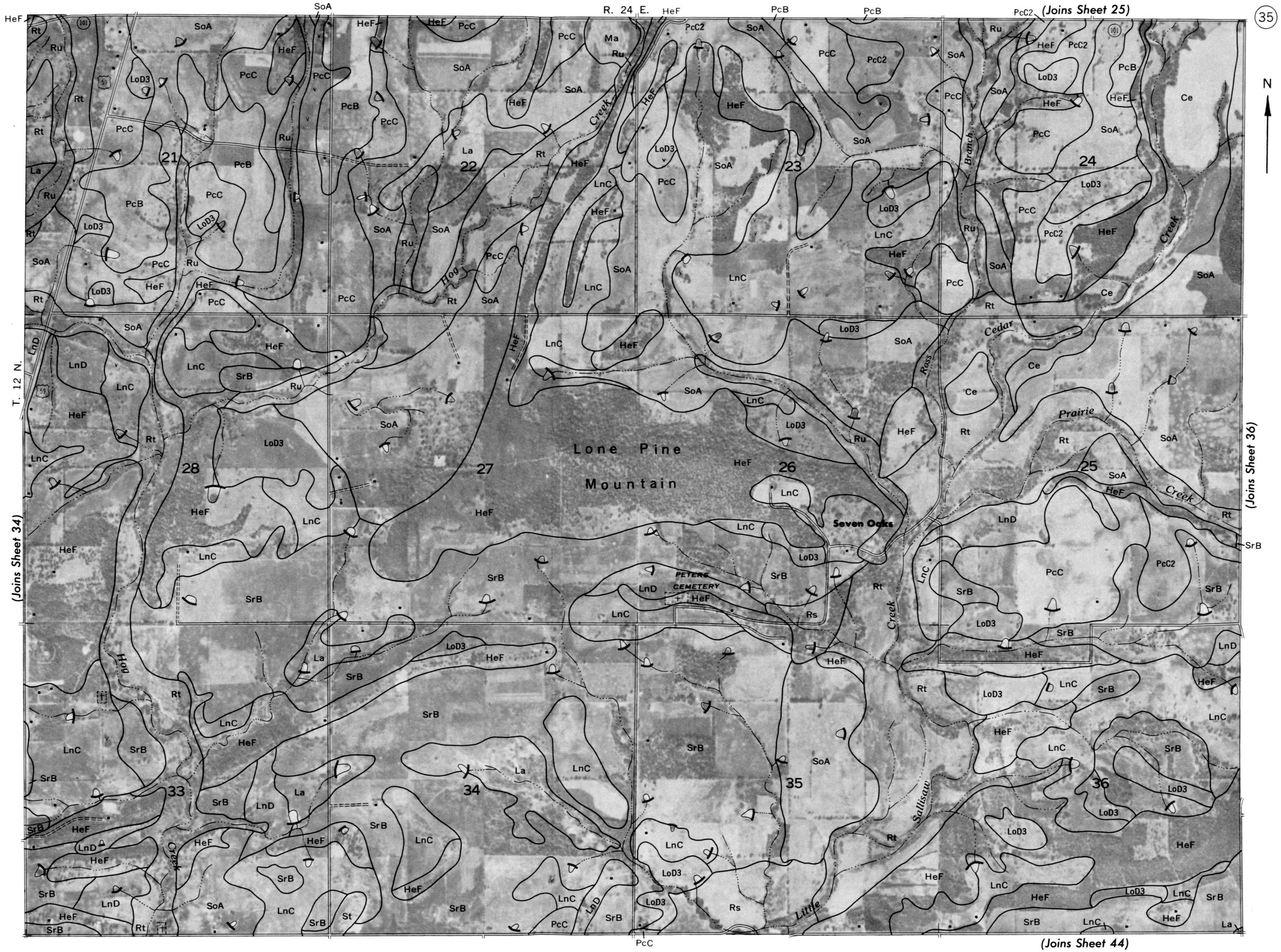
0 ½ 1 Mile
Scale 1:20 000
0 5 000 Feet

0 ½ 1 Mile Scale 1:20 000 0 5 000 Feet

SEQUOYAH COUNTY, OKLAHOMA NO. 34

Land division corners are approximately positioned on this map.

This map is one of a set compiled in 1968 as part of a soil survey by the Soil Conservation Service, United States Department of Agriculture, and the Oklahoma Agricultural Experiment Station.

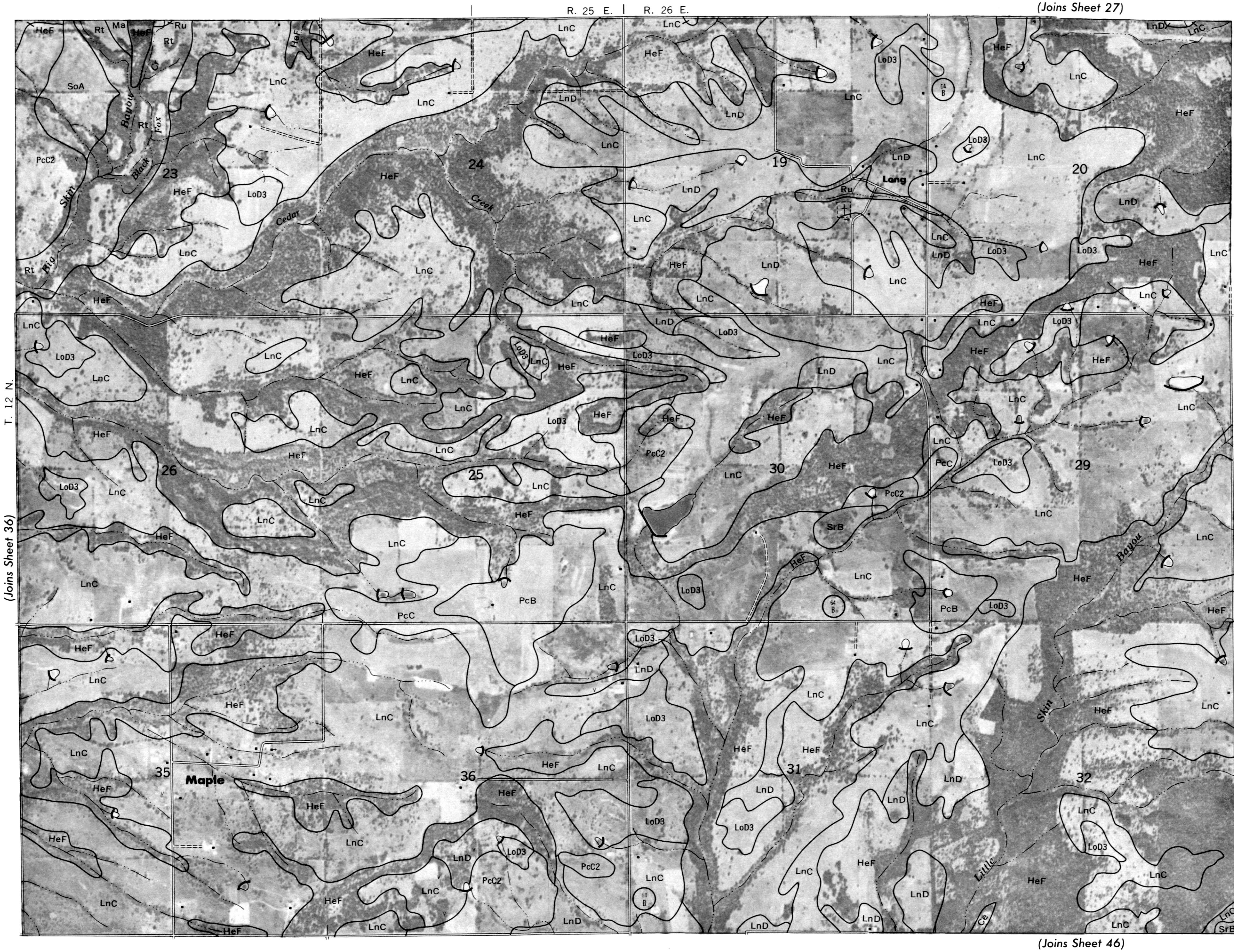


0 ½ 1 Mile Scale 1:20 000 0 5 000 Feet

This map is one of a set compiled in 1968 as part of a soil survey by the Soil Conservation Service, United States Department of Agriculture, and the Oklahoma Agricultural Experiment Station.
Land division corners are approximately positioned on this map.

0 ½ 1 Mile Scale 1:20 000 0 5 000 Feet

SEQUOYAH COUNTY, OKLAHOMA NO. 36
Land division corners are approximately positioned on this map.
This map is one of a set compiled in 1968 as part of a soil survey by the Soil Conservation Service, United States Department of Agriculture, and the Oklahoma Agricultural Experiment Station.



0 ½ 1 Mile Scale 1:20 000 0 5 000 Feet

This map is one of a set compiled in 1968 as part of a soil survey by the Soil Conservation Service, United States Department of Agriculture, and the Oklahoma Agricultural Experiment Station.
Land division corners are approximately positioned on this map.

SEQUOYAH COUNTY, OKLAHOMA NO. 37

0 ½ 1 Mile Scale 1:20 000 0 5 000 Feet

SEQUOYAH COUNTY, OKLAHOMA NO. 38
Land division corners are approximately positioned on this map.
This map is one of a set compiled in 1968 as part of a soil survey by the Soil Conservation Service, United States Department of Agriculture, and the Oklahoma Agricultural Experiment Station.

(Joins Sheet 29)

R. 27 E.

T. 12 N.

(Joins Sheet 38)

(Joins Sheet 48)

0 ½ 1 Mile Scale 1:20 000 0 5 000 Feet

This map is one of a set compiled in 1968 as part of a soil survey by the Soil Conservation Service, United States Department of Agriculture, and the Oklahoma Agricultural Experiment Station.
Land division corners are approximately positioned on this map.

SEQUOYAH COUNTY, OKLAHOMA NO. 39

40

(Joins Sheet 31)

R. 21 E. | R. 22 E.

T. 11 N.

(Joins Sheet 41)

(Joins inset, Sheet 49)

0 ½ 1 Mile

Scale 1:20 000

0 5 000 Feet

SEQUOYAH COUNTY, OKLAHOMA NO. 40

Land division corners are approximately positioned on this map.

This map is one of a set compiled in 1968 as part of a soil survey by the Soil Conservation Service, United States Department of Agriculture, and the Oklahoma Agricultural Experiment Station.

(Joins Sheet 32)

(Joins Sheet 40)

(Joins Sheet 42)

(Joins Sheet 49)

0 ½ 1 Mile Scale 1:20 000 0 5 000 Feet

This map is one of a set compiled in 1968 as part of a soil survey by the Soil Conservation Service, United States Department of Agriculture, and the Oklahoma Agricultural Experiment Station.
Land division corners are approximately positioned on this map.

SEQUOYAH COUNTY, OKLAHOMA NO. 41

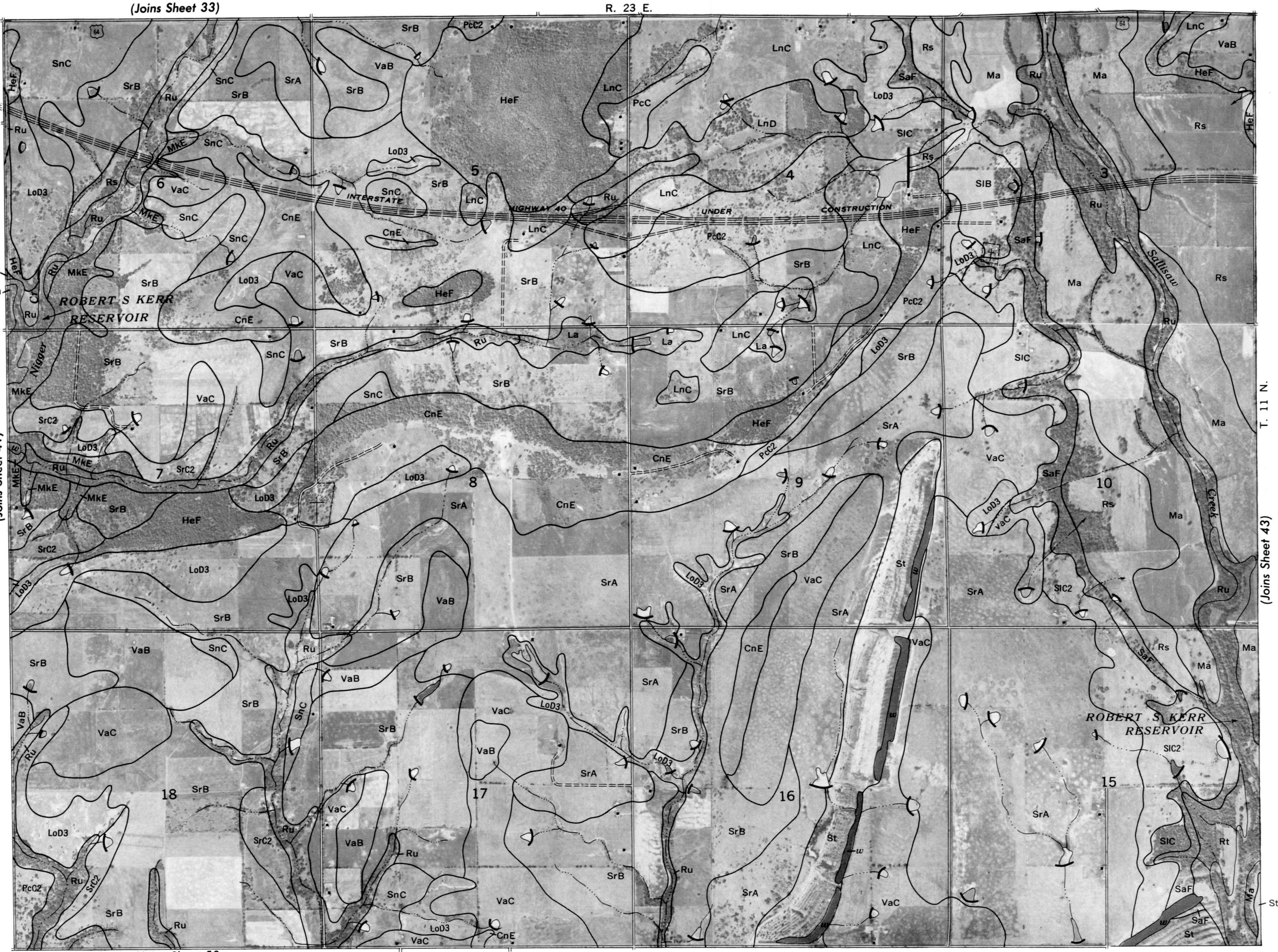
42

(Joins Sheet 33)

R. 23 E.

N

(Joins Sheet 41)



(Joins Sheet 43)

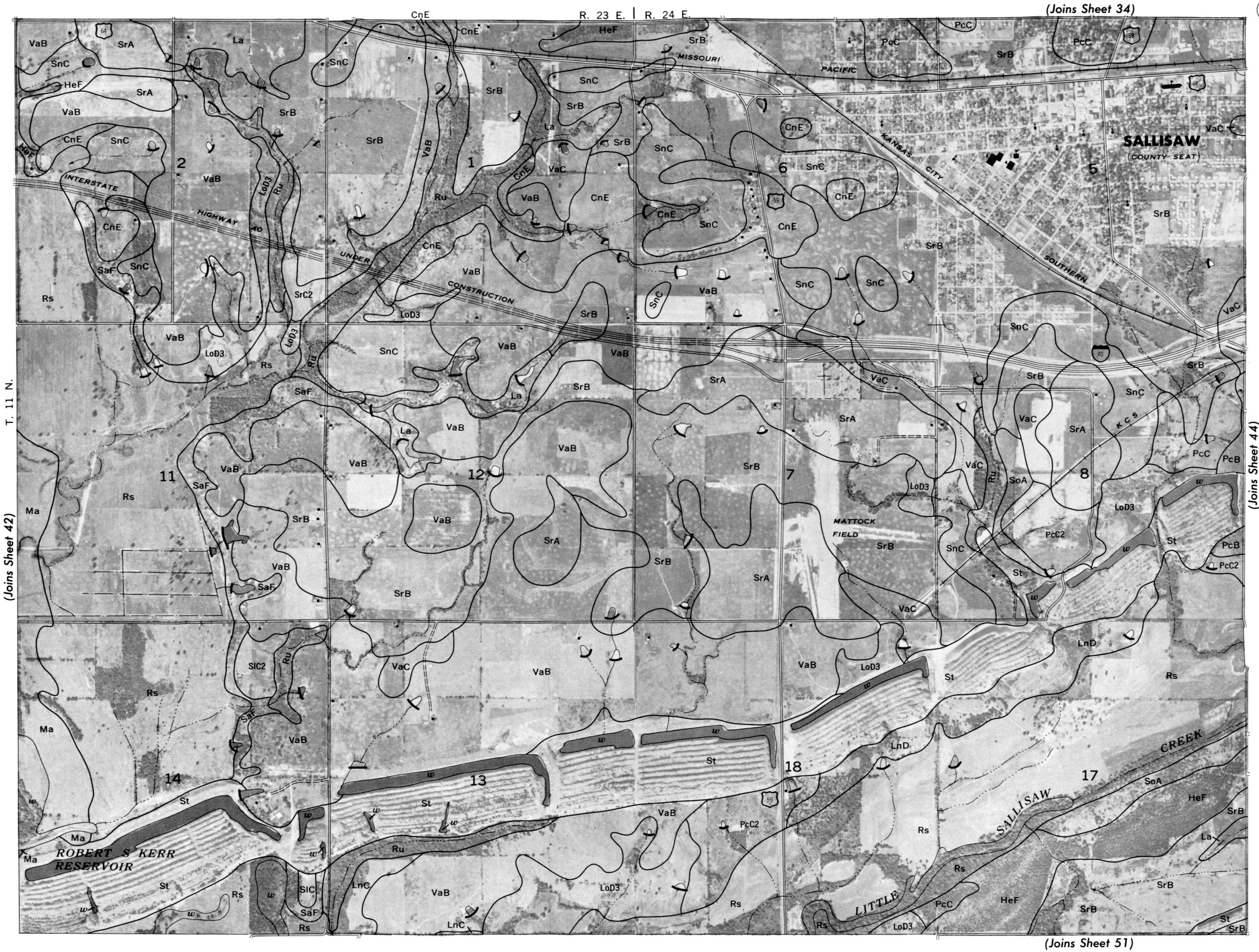
(Joins Sheet 50)

0 ½ 1 Mile Scale 1:20 000 0 5 000 Feet

SEQUOYAH COUNTY, OKLAHOMA NO. 42
Land division corners are approximately positioned on this map.
This map is one of a set compiled in 1968 as part of a soil survey by the Soil Conservation Service, United States Department of Agriculture, and the Oklahoma Agricultural Experiment Station.

This map is one of a set compiled in 1968 as part of a soil survey by the Soil Conservation Service, United States Department of Agriculture, and the Oklahoma Agricultural Experiment Station.
Land division corners are approximately positioned on this map.

SEQUOYAH COUNTY, OKLAHOMA NO. 43



0 ½ 1 Mile Scale 1:20 000 0 5 000 Feet

44

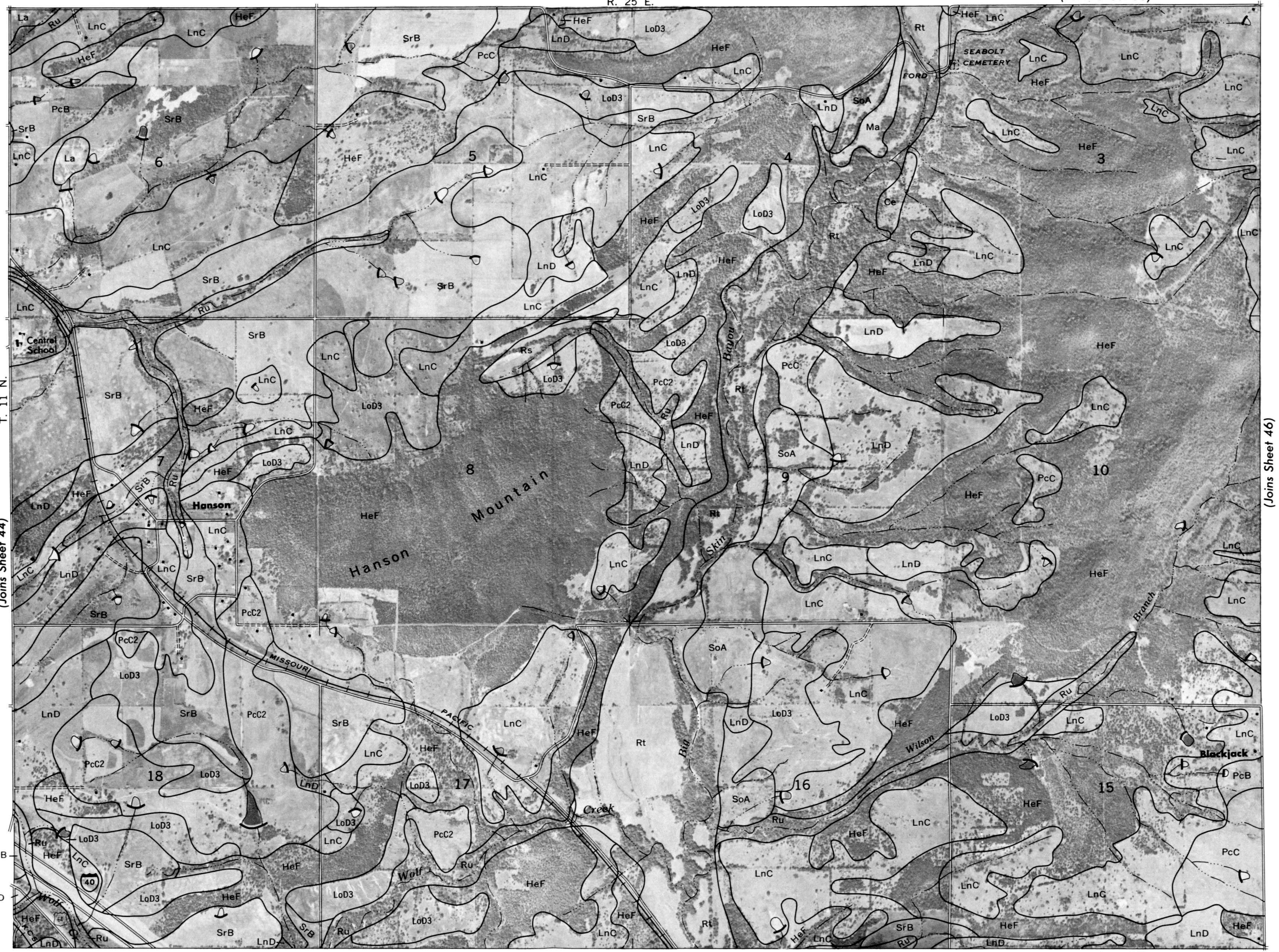
0 ½ 1 Mile Scale 1:20 000 0 5 000 Feet

SEQUOYAH COUNTY, OKLAHOMA NO. 44

Land division corners are approximately positioned on this map.

This map is one of a set compiled in 1968 as part of a soil survey by the Soil Conservation Service, United States Department of Agriculture, and the Oklahoma Agricultural Experiment Station.

(Joins Sheet 36)



(Joins Sheet 44)

(Joins Sheet 46)

(Joins Sheet 53)

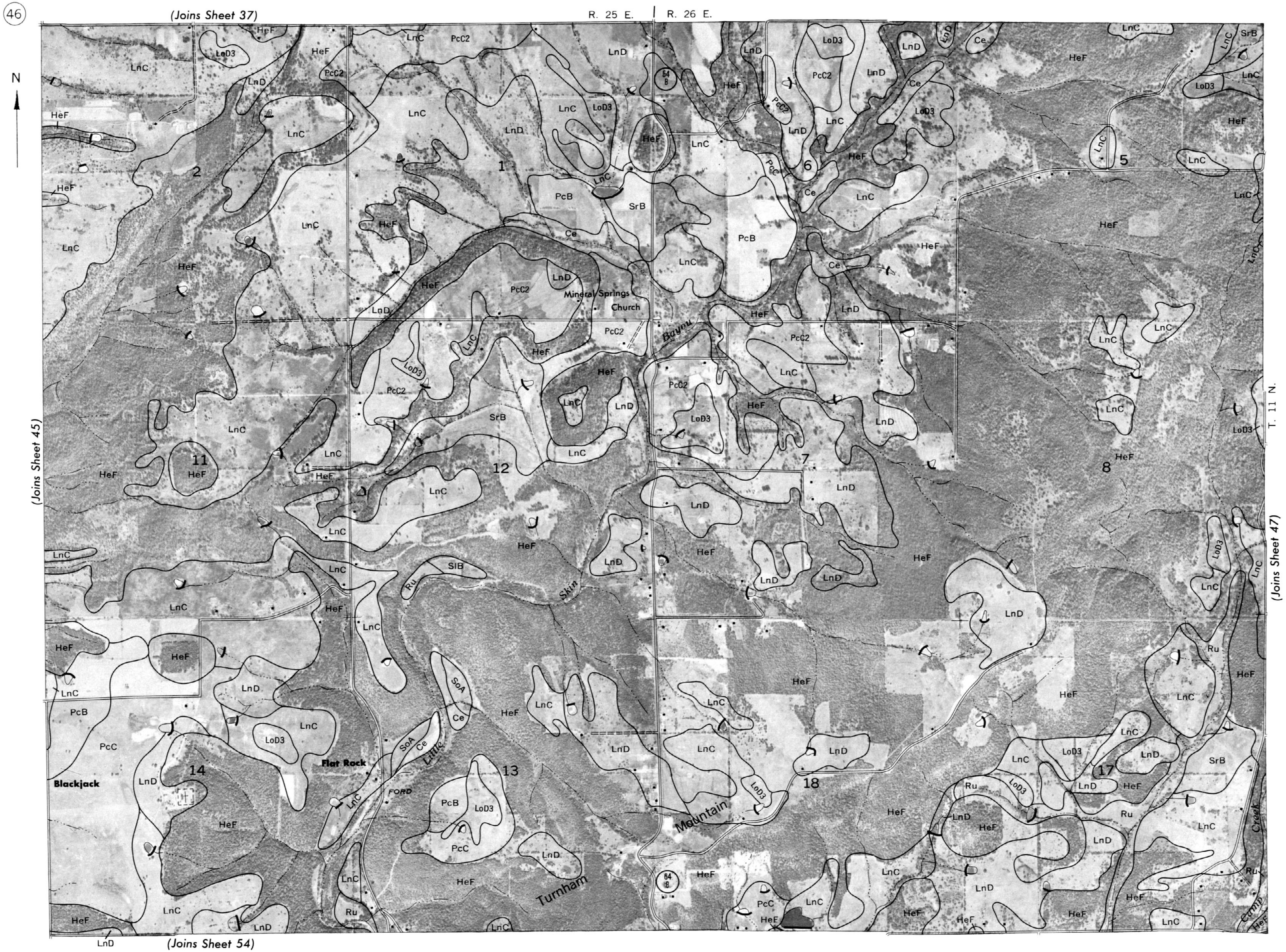
0 ½ 1 Mile

Scale 1:20 000

0 5 000 Feet

This map is one of a set compiled in 1968 as part of a soil survey by the Soil Conservation Service, United States Department of Agriculture, and the Oklahoma Agricultural Experiment Station.
Land division corners are approximately positioned on this map.

SEQUOYAH COUNTY, OKLAHOMA NO. 45



0 ½ 1 Mile Scale 1:20 000 0 5 000 Feet

SEQUOYAH COUNTY, OKLAHOMA NO. 46

Land division corners are approximately positioned on this map.

This map is one of a set compiled in 1968 as part of a soil survey by the Soil Conservation Service, United States Department of Agriculture, and the Oklahoma Agricultural Experiment Station.

This map is one of a set compiled in 1968 as part of a soil survey by the Soil Conservation Service, United States Department of Agriculture, and the Oklahoma Agricultural Experiment Station.
Land division corners are approximately positioned on this map.

SEQUOYAH COUNTY, OKLAHOMA NO. 47

0 ½ 1 Mile
Scale 1:20 000
0 5 000 Feet

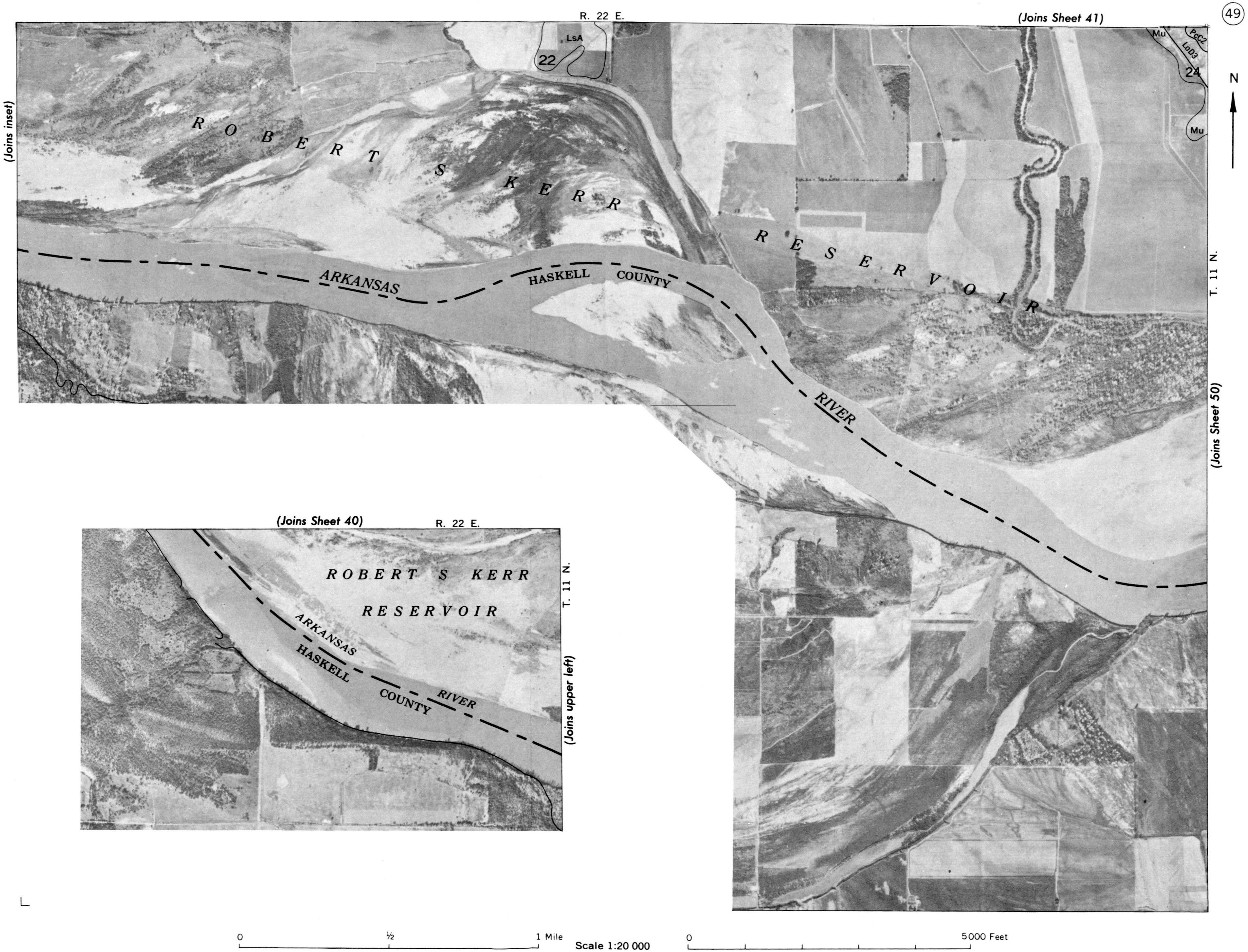
48

0 ½ 1 Mile Scale 1:20 000 0 5 000 Feet

SEQUOYAH COUNTY, OKLAHOMA NO. 48

Land division corners are approximately positioned on this map.

This map is one of a set compiled in 1968 as part of a soil survey by the Soil Conservation Service, United States Department of Agriculture, and the Oklahoma Agricultural Experiment Station.



This map is one of a set compiled in 1968 as part of a soil survey by the Soil Conservation Service, United States Department of Agriculture, and the Oklahoma Agricultural Experiment Station.

Land division corners are approximately positioned on this map.

SEQUOYAH COUNTY, OKLAHOMA NO. 49

50

Scale 1:20 000

0 ½ 1 Mile

0 5 000 Feet

SEQUOYAH COUNTY, OKLAHOMA NO. 50

Land division corners are approximately positioned on this map.

This map is one of a set compiled in 1968 as part of a soil survey by the Soil Conservation Service, United States Department of Agriculture, and the Oklahoma Agricultural Experiment Station.

0 ½ 1 Mile Scale 1:20 000 0 5 000 Feet

This map is one of a set compiled in 1968 as part of a soil survey by the Soil Conservation Service, United States Department of Agriculture, and the Oklahoma Agricultural Experiment Station.
Land division corners are approximately positioned on this map.

52

(Joins Sheet 44)

R. 24 E.

(Joins Sheet 51)

T. 11 N.

(Joins Sheet 53)

(Joins Sheet 59)

0 ½ 1 Mile

Scale 1:20 000

0 5 000 Feet

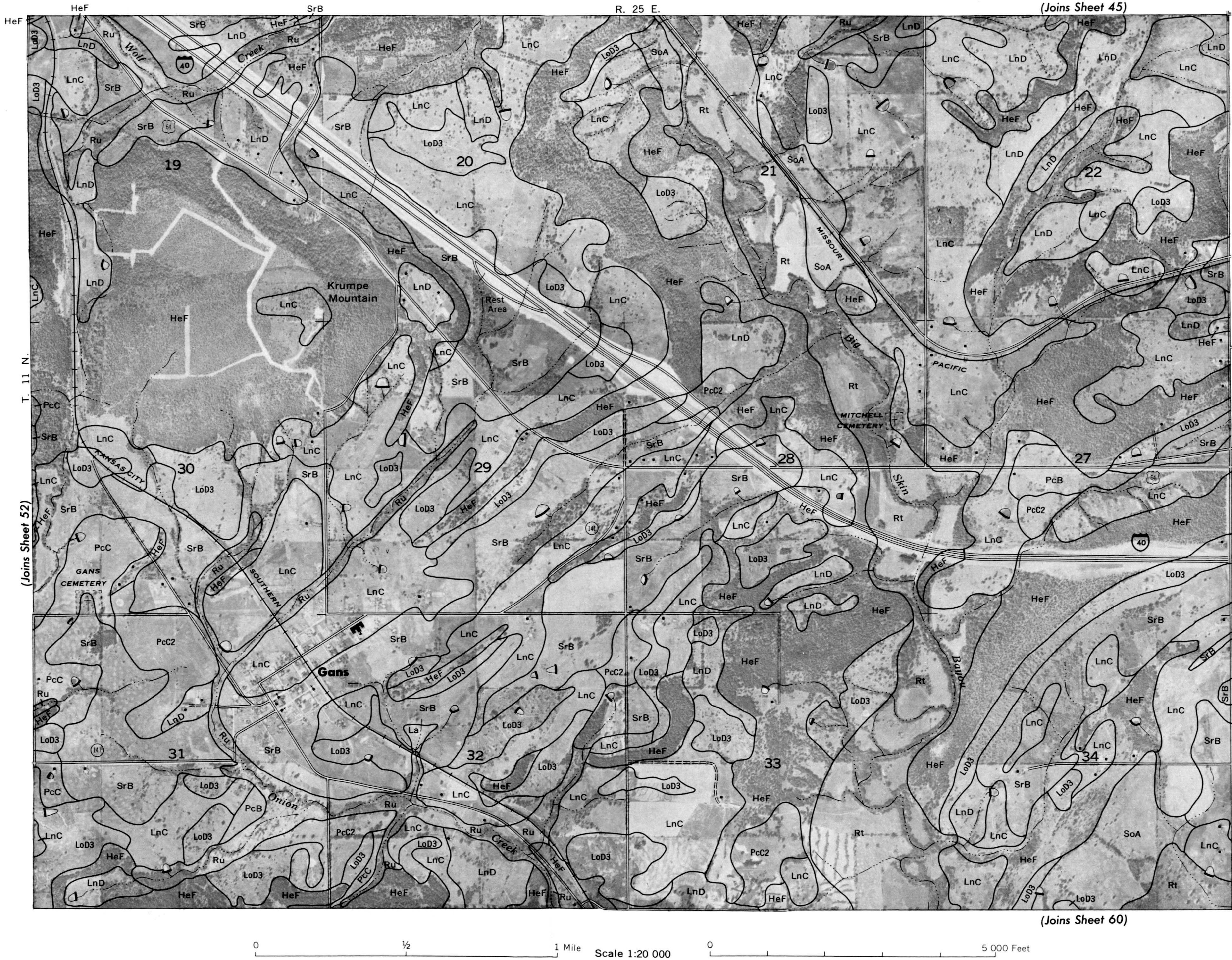
SEQUOYAH COUNTY, OKLAHOMA NO. 52

Land division corners are approximately positioned on this map.

This map is one of a set compiled in 1968 as part of a soil survey by the Soil Conservation Service, United States Department of Agriculture, and the Oklahoma Agricultural Experiment Station.

This map is one of a set compiled ni 1968 as part of a soil survey by the Soil Conservation Service, United States Department of Agriculture, and the Oklahoma Agricultural Experiment Station.
Land division corners are approximately positioned on this map.

SEQUOYAH COUNTY, OKLAHOMA NO. 53



54

0 ½ 1 Mile Scale 1:20 000 0 5 000 Feet

SEQUOYAH COUNTY, OKLAHOMA NO. 54

Land division corners are approximately positioned on this map.

This map is one of a set compiled in 1968 as part of a soil survey by the Soil Conservation Service, United States Department of Agriculture, and the Oklahoma Agricultural Experiment Station.

0 ½ 1 Mile Scale 1:20 000 0 5 000 Feet

This map is one of a set compiled in 1968 as part of a soil survey by the Soil Conservation Service, United States Department of Agriculture, and the Oklahoma Agricultural Experiment Station.
Land division corners are approximately positioned on this map.
SEQUOYAH COUNTY, OKLAHOMA NO. 55

56

(Joins Sheet 48)

R. 27 E.

N

T. 11 N.

(Joins Sheet 55)

(Joins Sheet 63)

0 ½ 1 Mile Scale 1:20 000 0 5 000 Feet

SEQUOYAH COUNTY, OKLAHOMA NO. 56

Land division corners are approximately positioned on this map.

This map is one of a set compiled in 1968 as part of a soil survey by the Soil Conservation Service, United States Department of Agriculture, and the Oklahoma Agricultural Experiment Station.

R. 23 E.

(Joins Sheet 50)

57

T. 10 N.

N

(Joins Sheet 58)

0 ½ 1 Mile Scale 1:20 000 0 5 000 Feet

This map is one of a set compiled in 1968 as part of a soil survey by the Soil Conservation Service, United States Department of Agriculture, and the Oklahoma Agricultural Experiment Station.
Land division corners are approximately positioned on this map.
SEQUOYAH COUNTY, OKLAHOMA NO. 57

58

(Joins Sheet 51)

R. 23 E. | R. 24 E.

(Joins Sheet 57)

N

(Joins Sheet 59)

(Joins inset, Sheet 59)

0 ½ 1 Mile Scale 1:20 000 0 5 000 Feet

SEQUOYAH COUNTY, OKLAHOMA NO. 58

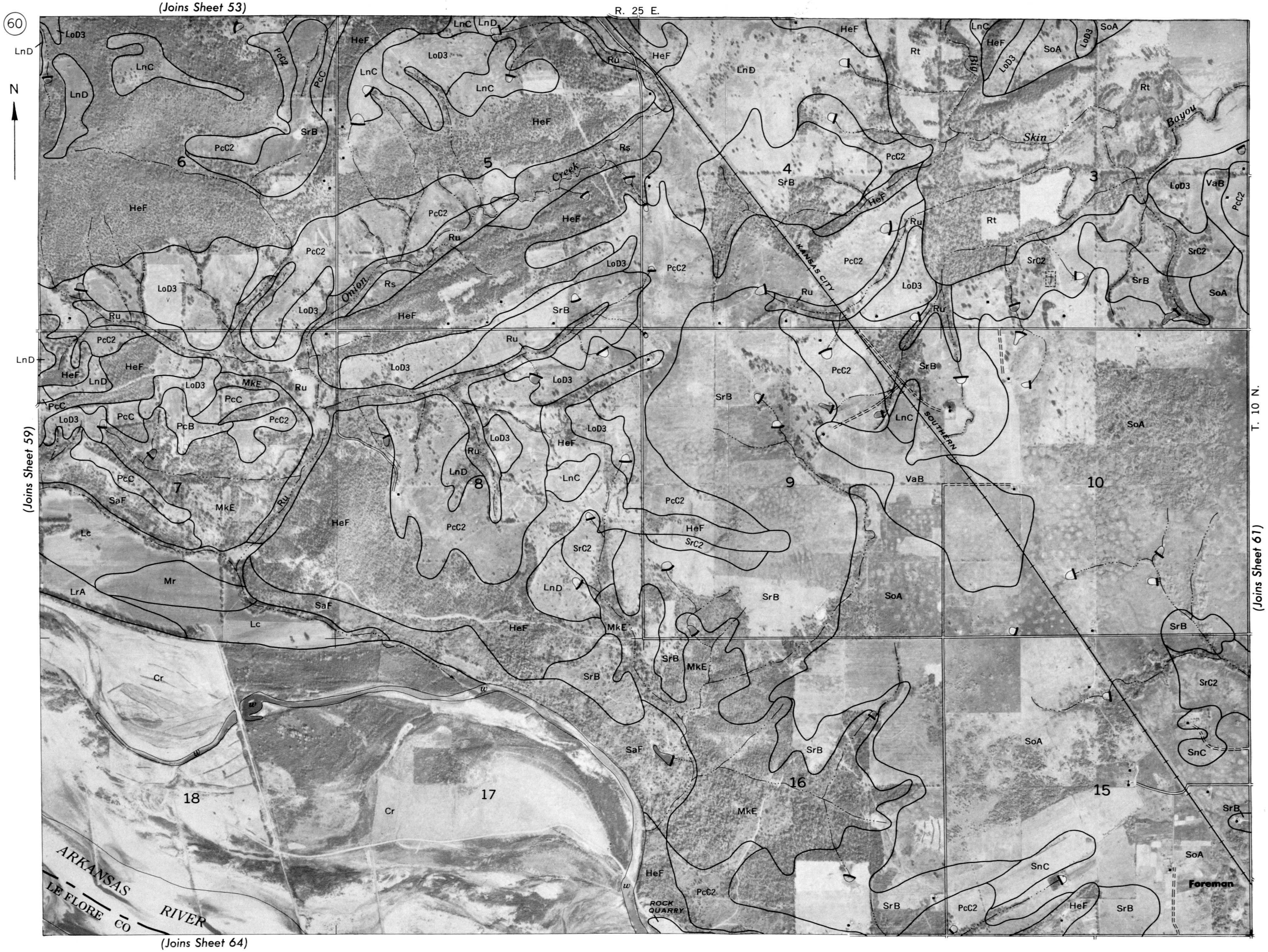
Land division corners are approximately positioned on this map.

This map is one of a set compiled in 1968 as part of a soil survey by the Soil Conservation Service, United States Department of Agriculture, and the Oklahoma Agricultural Experiment Station.

0 ½ 1 Mile Scale 1:20 000 0 5 000 Feet

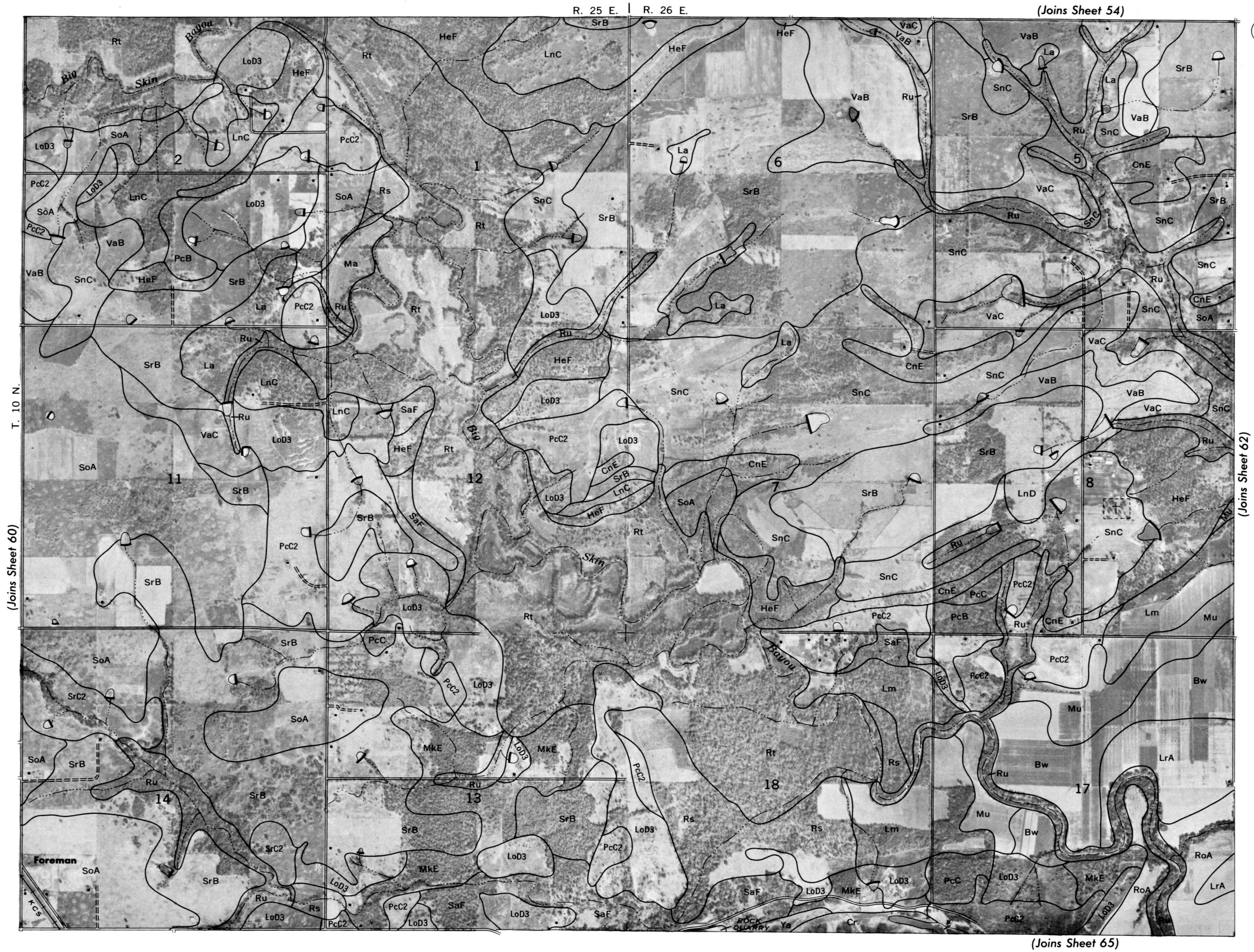
This map is one of a set compiled in 1968 as part of a soil survey by the Soil Conservation Service, United States Department of Agriculture, and the Oklahoma Agricultural Experiment Station.
Land division corners are approximately positioned on this map.

SEQUOYAH COUNTY, OKLAHOMA — SHEET NUMBER 60



0 ½ 1 Mile Scale 1:20 000 0 5 000 Feet

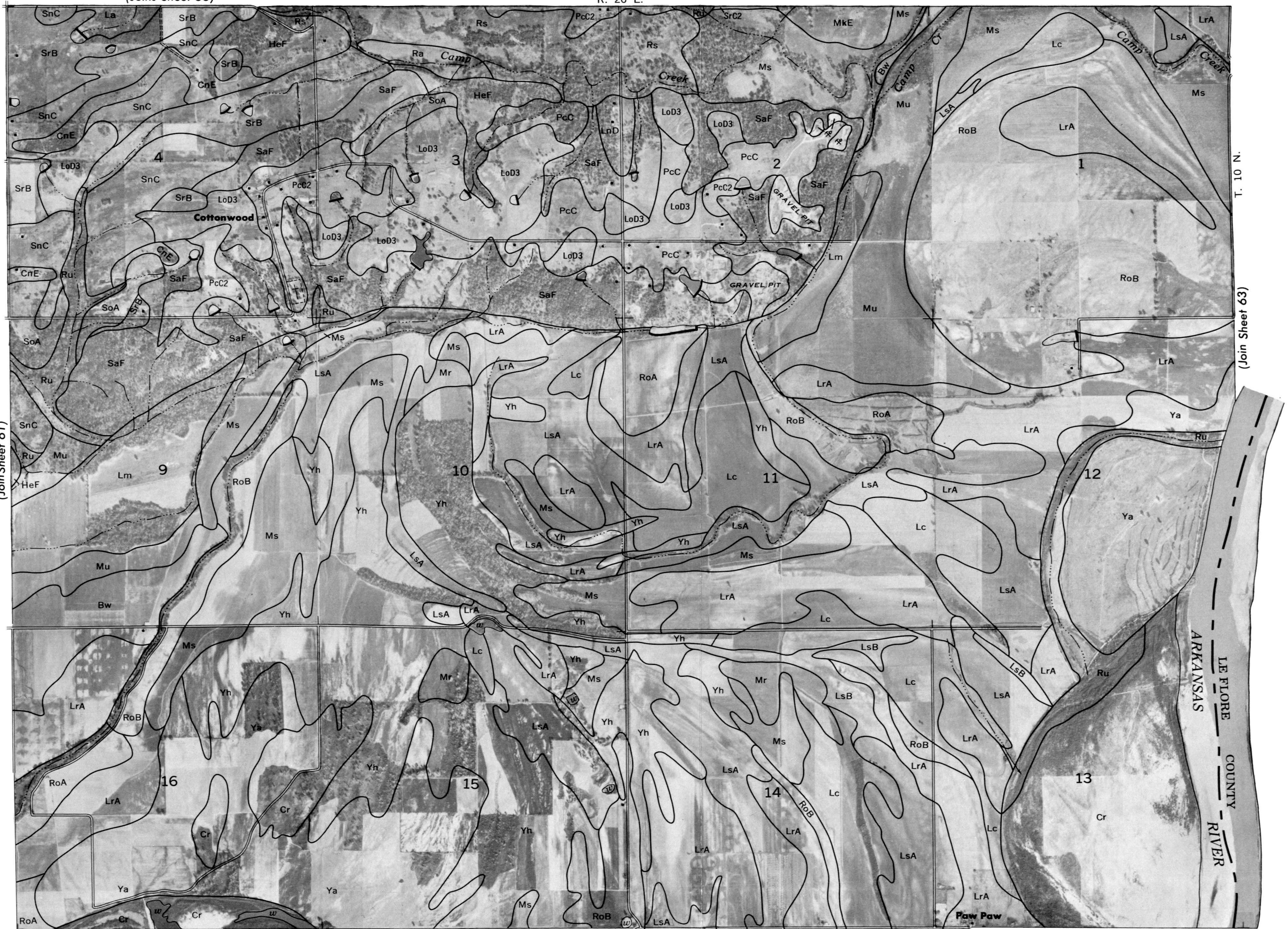
SEQUOYAH COUNTY, OKLAHOMA NO. 60
Land division corners are approximately positioned on this map.
This map is one of a set compiled in 1968 as part of a soil survey by the Soil Conservation Service, United States Department of Agriculture, and the Oklahoma Agricultural Experiment Station.



0 ½ 1 Mile Scale 1:20 000 0 5 000 Feet

This map is one of a set compiled in 1968 as part of a soil survey by the Soil Conservation Service, United States Department of Agriculture, and the Oklahoma Agricultural Experiment Station.
Land division corners are approximately positioned on this map.

(Joins Sheet 55)



(Joins Sheet 66)

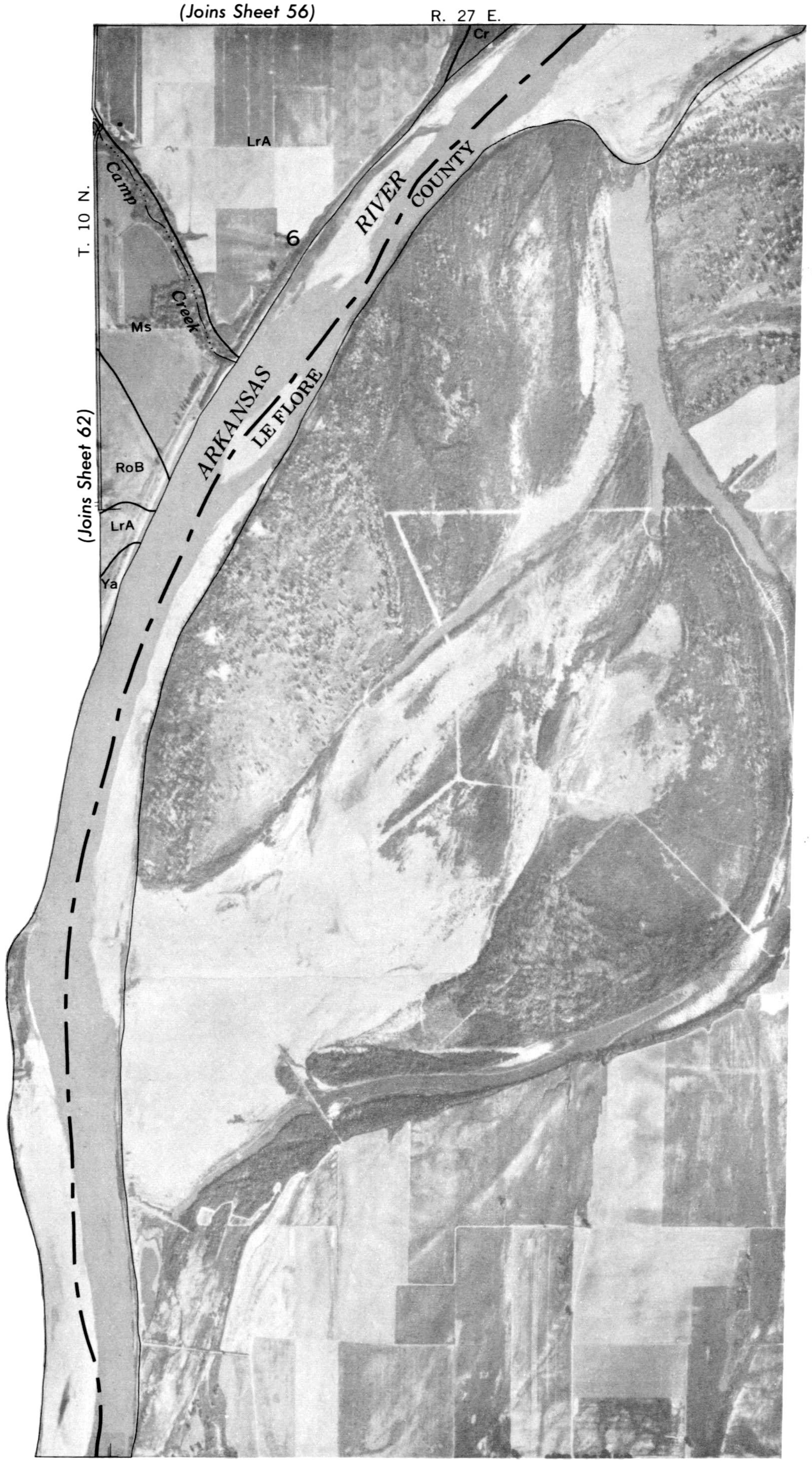
0 1 Mile Scale 1:20 000 0 5 000 Feet

SEQUOYAH COUNTY, OKLAHOMA NO. 62

Land division corners are approximately positioned on this map.

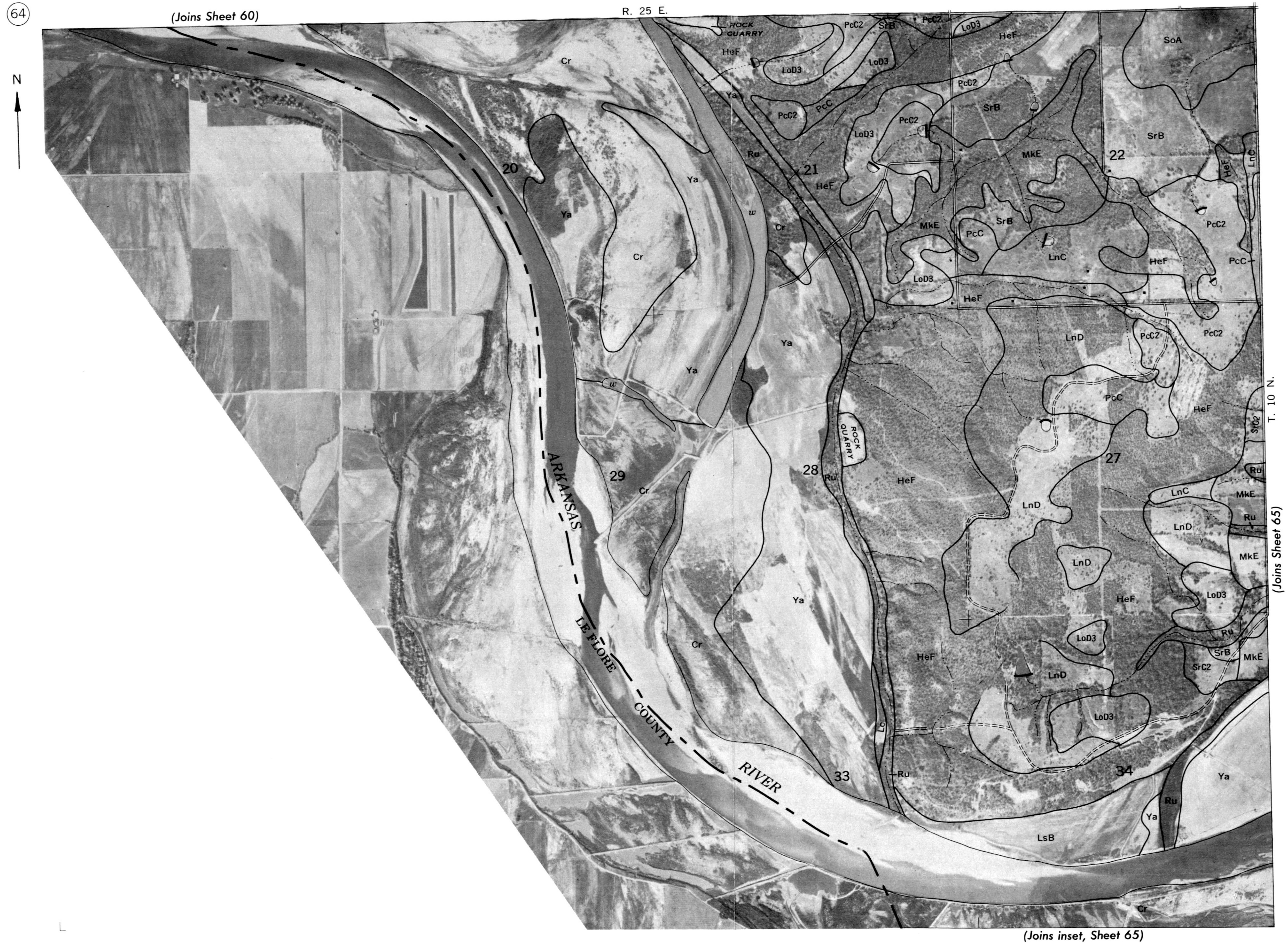
This map is one of a set compiled in 1968 as part of a soil survey by the Soil Conservation Service, United States Department of Agriculture, and the Oklahoma Agricultural Experiment Station.

N



0 ½ 1 Mile Scale 1:20 000 0 5 000 Feet

This map is one of a set compiled in 1968 as part of a soil survey by the Soil Conservation Service, United States Department of Agriculture, and the Oklahoma Agricultural Experiment Station.
Land division corners are approximately positioned on this map.



Scale 1:20 000

0 ½ 1 Mile

0 5 000 Feet

SEQUOYAH COUNTY, OKLAHOMA NO. 64

Land division corners are approximately positioned on this map.

This map is one of a set compiled in 1968 as part of a soil survey by the Soil Conservation Service, United States Department of Agriculture, and the Oklahoma Agricultural Experiment Station.

0 ½ 1 Mile Scale 1:20 000 0 5 000 Feet

This map is one of a set compiled in 1968 as part of a soil survey by the Soil Conservation Service, United States Department of Agriculture, and the Oklahoma Agricultural Experiment Station.
Land division corners are approximately positioned on this map.

SEQUOYAH COUNTY, OKLAHOMA NO. 65

0 ½ 1 Mile Scale 1:20 000 0 5 000 Feet

SEQUOYAH COUNTY, OKLAHOMA NO. 66

Land division corners are approximately positioned on this map.

This map is one of a set compiled in 1967 as part of a soil survey by the Soil Conservation Service, United States Department of Agriculture, and the Oklahoma Agricultural Experiment Station.